

Proceeding Paper

Exploratory Study of Preservice Early-Childhood Teachers' Experiences of Electronic Toys and Play Preference [†]

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Abstract: Digital play has gradually become popular in young children's families, and electronic toys have become an important type of toy for young children. This study concerns preservice early-childhood teachers' preferences about play and how their experiences with electronic toys in childhood influence their preferences about play. A total of 108 preservice early-childhood teachers participated in this study, and data were collected through questionnaires with them. The results revealed that these preservice teachers rated different play activities as follows: constructive play, expressive play, pretend play, digital play, and gameplay. In addition, preservice teachers who favored traditional toys in childhood preferred constructive play more than those who favored electronic toys. The results of the study provide useful suggestions for the design of electronic toys and preparation programs offered for preservice early-childhood teachers in the future.

Keywords: digital play; electronic toys; play preference; preservice early-childhood teacher

1. Introduction

Play is important for young children in their everyday lives. Carefully scaffolded, child-directed play can help children in math learning, symbol representation, literacy, decision making, and self-regulation [1]. Although several researchers argue that digital play is different from traditional play, research articles published between 2010 and 2020 indicated that digital play is "real play" [2]. Electronic toys have become an important type of toy for parents to select for children.

In this study, electronic toys are defined as toys or technology products composed of electronic and IC parts with batteries, computer chips, or other technological functions. They include electric cars, toys that make sounds and lights, Pleo robotic dinosaurs, Embassy robots, digital cameras, computer software, language-learning machines, and others. Teachers play a crucial role in young children's play activities, including creating places for play and facilitating them in creating playful and joyful experiences to support educational goals [3]. Teachers also provide suggestions for parents regarding children's play and toy selection. Therefore, preservice early-childhood teachers' preferences about playing were investigated in this study to understand how their experiences with electronic toys in childhood influenced their play preferences. The research questions are as follows. (1) What are preservice early-childhood teachers' preferences about play? (2) Do preservice early-childhood teachers' toy experiences in childhood influence their preferences about play?

2. Teachers' Role and Play Preferences

Teachers play a crucial role in young children's play [3]. The roles that teachers play while interacting with preschool children during free play include onlooker, player, and leader. When teachers play the "onlooker", they usually watch children's play and query



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about play. However, when they are directly involved in the play, they become the “player” and communicate with the children. Sometimes, teachers become the “leader” to initiate play and demonstrate how to play. Furthermore, the teachers’ role is affected by their perceptions of how to stimulate children’s learning, and they assume multiple roles in facilitating children’s play [4].

In addition to the types of teacher–child interaction during play, the enhanced effects of teacher–child interaction have been reported in studies. Reference [5] examined the relationship between teachers’ interaction with children and their play and indicated the enhancing effects of teacher–child interaction. Therefore, after the teacher demonstrated activities, guided children’s participation, and interpreted activities, children were able to self-regulate and participate in similar activities by themselves.

As for teachers’ play preferences, 515 Australian early-childhood educators were surveyed, and 52% of the respondents indicated that they did not agree that young children benefited from digital technology in terms of learning [6]. Early-childhood teachers’ concerns about young children’s technology use might include issues with children’s development and maturation and the influence of technology on children’s social skills, relations, language, as well as brain development [7].

A similar result was found in [8]. They investigated parents’ play preferences across the USA, Turkey, China, and South Korea, and found that digital play was the least preferred play for parents. In addition, when parents reported longer technology use for their children, they preferred digital play more. It seemed that most parents preferred a balance of all play activities, and their negative perceptions about the digital play were related to issues of addiction and antisocialization [9].

For several preservice early-childhood teachers, play is more social and physical activity than cognitive activity. Moreover, preservice early-childhood teachers’ perceptions about play seem to be influenced by early-childhood teacher education programs [10].

3. Play Types and Digital Play for Young Children

For young children, play can be integrated into the early-childhood curriculum as free play, guided play, and games [3]. Reference [11] modified cognitive play in [12] and classified four categories of children’s cognitive play as functional play, constructive play, dramatic play, and games with rules.

With the prevalence of technology, digital play is becoming an important aspect of children’s lives. Digital play is now recognized as a form of play [13,14]. Digital play is “related to video and computer games, internet sites and search engines, electronic toys, mobile technologies, smartphones, iPads, and tablets” [8] (p. 133). Reference [9] investigated 21 medium- or high-income Portuguese families with at least one child under 8 years old and found that children used diverse digital media at home, including smartphones, laptops, and tablets. Moreover, more than half of the children owned personal devices. Children mostly used tablets and mainly for playing games and watching videos on YouTube. Technologies can be viewed as cultural tools for 4- and 5-year-old children’s play. Young children’s epistemic play, such as exploratory behaviors, is often related to the functions of technology. On the other hand, ludic play is associated with the application of technologies for children’s symbolic play. Furthermore, young children’s digital play begins with exploring the functions of the given technologies through epistemic activities, and then by creating play content through ludic activities [15].

Reference [16] observed preschool children’s play with technologies and proposed a digital play framework that consists of three major types: mastery play, imaginative play, and deep play. In mastery play, young children create things in the virtual environment. Young children can also pretend to care for digital pets in their imaginative play. As for deep play, when young children encounter fearful experiences in the digital world, they have more control over the outcomes than they do in the physical environment. Although digital play seems to be similar to traditional play, the educational goals of digital play (e.g.,

smarter, stronger, and kinder) and the effects of digital games on young children remain unclear [17].

4. Method

In this study, data were collected through questionnaires to investigate preservice early-childhood teachers' preferences about play and how their experiences with electronic toys in childhood influence their play preferences. The participants and instruments of the study are stated in the following.

4.1. Participants

To investigate preservice early-childhood teachers' preferences about play and their toy experiences in childhood, 122 questionnaires were sent to preservice early-childhood teachers at a university in Taiwan and 116 questionnaires were returned, with a return rate of about 95%. A total of 108 questionnaires were analyzed. Three participants were male, and the others were females. Participants' ages ranged from 19 to 24 years old with a mean of 19.30.

4.2. Instruments

The contents of the questionnaire included questions regarding preservice teachers' play preferences and their experiences with electronic toys in childhood. Preservice early-childhood teachers' play preferences were assessed using an adaptation of Johnson's Play Attitude Questionnaire (PA). The reliability of the scale was assessed with a sample of preschool teachers and mothers of preschool children. The test-retest reliability of the instrument was 0.71 [18].

The play preferences questionnaire used for this study consisted of 10 items, 2 items each for the five types of play. These 10 items were for paired comparisons requiring respondents to choose one of the two play activities that they thought was more important for the child to spend time on. The items are listed as follows.

- (1) Constructive play: making something from different materials, and building something with table blocks.
- (2) Pretend play: make-believe with small figures, and pretending to be a favorite character.
- (3) Gameplay: playing a board game, and playing connect-the-dots game.
- (4) Digital play: using computers to create things (e.g., funny animals), and imagining with little people on a computer screen (e.g., making them move, jump, or run).
- (5) Expressive play: singing children's songs, and dancing and movement expression.

5. Results

The results of the study are discussed based on two aspects: (1) preservice early-childhood teachers' play preferences and (2) preservice early-childhood teachers' toy experiences in childhood. In addition, how preservice early-childhood teachers' experiences of electronic toys in childhood influence their preferences about playing is also discussed.

5.1. Preservice Early-Childhood Teachers' Play Preferences

One of the objectives of the study was to elicit preservice early-childhood teachers' preferences for different play activities for young children. The mean scores on preservice teachers' preferences for constructive play, expressive play, pretend play, digital play, and gameplay are presented in Table 1.

The mean scores on play activities varied from a high of 5.63 for constructive play to a low of 2.12 for gameplay. They rated different play activities in the order of constructive play, expressive play, pretend play, digital play, and gameplay. Preservice teachers endorsed constructive play and regarded it as a proper play activity for young children. They did not prefer gameplay or digital play.

Table 1. Preservice early-childhood teachers’ play preferences.

Play Preferences	M	SD	Range
Constructive play	5.63	0.15	1–8
Expressive play	5.02	0.18	1–8
Pretend play	4.40	0.16	0–8
Digital play	2.83	0.20	0–8
Game play	2.12	0.16	0–6

Note. N = 108 (“N” means the total number of the sample).

5.2. Preservice Early-Childhood Teachers’ Toy Experiences in Childhood

As for preservice teachers’ toy experiences in childhood, about 21.3% did not have electronic toy experiences in childhood. In addition, 22.6% favored electronic toys, and 86.0% owned more traditional toys in childhood (Table 2).

Table 2. Preservice early-childhood teachers’ toy experiences.

Play Experiences		n (%)
Electronic Toy Use in Childhood	Yes	23 (21.3%)
	No	85 (78.7%)
Favorite Toy in Childhood	Traditional toy	82 (77.4%)
	Electronic toy	24 (22.6%)
Number of Toys in Childhood	More traditional toys	92 (86.0%)
	More electronic toys or an equivalent amount	15 (14.0%)

Preservice teachers who favored electronic toys and those who favored traditional toys are compared in terms of play preferences in Table 3. Both groups rated constructive play the highest and gameplay the lowest. Moreover, preservice teachers who favored traditional toys in childhood rated constructive play higher than those who favored electronic toys at $t(104) = 2.31$ and $p < 0.05$.

Table 3. Differences in play preferences of preservice teachers with different toy experiences in childhood.

Play Preferences	Favorite Toy in Childhood	n	M	SD	t
Constructive play	Traditional toy	82	5.84	1.51	2.31 *
	Electronic toy	24	5.04	1.43	
Expressive play	Traditional toy	82	5.06	1.84	0.53
	Electronic toy	24	4.83	1.90	
Pretend play	Traditional toy	82	4.28	1.64	−1.11
	Electronic toy	24	4.71	1.71	
Digital play	Traditional toy	82	2.76	2.03	−1.00
	Electronic toy	24	3.25	2.42	
Game play	Traditional toy	82	2.06	1.67	−0.27
	Electronic toy	24	2.17	1.81	

Note. * $p < 0.05$.

The data indicated that both groups (preservice teachers who favored electronic toys and traditional toys in childhood) preferred constructive play, but they did not prefer digital play or gameplay, relatively. In addition, preservice teachers who favored traditional toys in childhood preferred constructive play more than preservice teachers who favored electronic toys.

6. Conclusions

The results of the study reveal that preservice teachers endorsed constructive play and regarded it as a proper play activity for young children. They did not prefer gameplay or

digital play. The results are consistent with [6,8]. Parents across four countries reported that digital play was the least preferred play [8]. In addition, more than half of the early-childhood educators indicated that they did not agree that young children benefit from digital technology in terms of learning [6]. Parents also preferred a balance of all play activities, and their negative perceptions about digital play were related to children's addiction and antisocialization [9].

The issues concerning young children's technology use might include children's development and maturation and the influence of technology on children's social skills, relations, language, and brain development [7]. Therefore, the reason why preservice early-childhood teachers in this study did not prefer digital play might be due to their concerns about the educational goals of digital play [17].

The results of the study also indicated that preservice teachers who favored traditional toys in childhood preferred constructive play more than preservice teachers who favored electronic toys. Similar results were found in [8]. When parents reported longer technology use for their children, they preferred digital play. However, in this study, regardless of the fact that preservice early-childhood teachers favored electronic toys or traditional toys in childhood, they tended to prefer constructive play. They did not prefer digital play or gameplay. The reasons for their play preferences remain unclear, which needs further investigation.

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References

1. Anderson, G.T.; Spainhower, A.R.; Sharp, A.C. Where do the bears go? The value of child-directed play. In *Spotlight on Young Children: Exploring Play*; Bohart, H., Charner, K., Koralek, D., Eds.; NAEYC: Washington, DC, USA, 2015; pp. 37–45.
2. Undheim, M. Children and teachers engaging together with digital technology in early childhood education and care institutions: A literature review. *Eur. Early Child. Educ. Res. J.* **2022**, *30*, 472–489. [[CrossRef](#)]
3. Zosh, J.M.; Gaudreau, C.G.; Golinkoff, R.M.; Hirsh-Pasek, K. The power of playful learning in the early childhood setting. *Young Child.* **2022**, *77*, 6–13.
4. Roskos, K.; Neuman, S.B. Descriptive observations of adult's facilitation of literacy in young children's play. *Early Child. Res. Q.* **1993**, *8*, 77–97. [[CrossRef](#)]
5. Zukow, P.G. The relationship between interaction with the caregiver and the emergence of play activities during the one-word period. *Br. J. Dev. Psychol.* **1986**, *4*, 223–234. [[CrossRef](#)]
6. Zabatiero, J.; Straker, L.; Mantilla, A.; Edwards, S.; Danby, S. Young Children and Digital Technology: Australian Early Childhood Education and Care Sector Adults' Perspectives. *Aust. J. Early Child.* **2018**, *43*, 14–22. [[CrossRef](#)]
7. Hatzigianni, M.; Kalaitzidis, I. Early childhood educators' attitudes and beliefs around the use of touchscreen technologies by children under three years of age. *Brit. J. Educ. Technol.* **2018**, *49*, 883–895. [[CrossRef](#)]
8. Erdogan, N.I.; Johnson, J.E.; Dong, P.I.; Qiu, Z. Do parents prefer digital play? examination of parental preferences and beliefs in four nations. *Early Child. Educ. J.* **2019**, *47*, 131–142. [[CrossRef](#)]
9. Brito, R.; Dias, P.; Oliveira, G. Young children, digital media and smart toys: How perceptions shape adoption and domestication. *Brit. J. Educ. Technol.* **2018**, *49*, 807–820. [[CrossRef](#)]
10. Zhulamanova, I.; Raisor, J. Early childhood preservice teachers' perceptions on children's play. *Int. Online J. Prim. Educ.* **2020**, *9*, 128–143.
11. Smilansky, S. *The Effects of Sociodramatic Play on Disadvantaged Preschool Children*; John Wiley: New York, NY, USA, 1968.
12. Piaget, J. *Play, Dreams and Imitation in Childhood*; W. W. Norton: New York, NY, USA, 1962.
13. Disney, L.; Geng, G. Investigating young children's social interactions during digital play. *Early Child. Educ. J.* **2022**, *50*, 1449–1459. [[CrossRef](#)] [[PubMed](#)]
14. Edwards, S. Digital play and technical code: What new knowledge formations are possible? *Learn. Media Technol.* **2021**, *46*, 306–319. [[CrossRef](#)]

15. Bird, J.; Edwards, S. Children learning to use technologies through play: A digital play framework. *Brit. J. Educ. Technol.* **2015**, *46*, 1149–1160. [[CrossRef](#)]
16. Marsh, J.; Plowman, L.; Yamada-Rice, D.; Bishop, J.; Scott, F. Digital play: A new classification. *Early Years* **2016**, *36*, 242–253. [[CrossRef](#)]
17. Flynn, R.M.; Richert, R.A.; Wartella, E. Play in a digital world: How interactive digital games shape the lives of children. *Am. J. Play* **2019**, *12*, 54–73.
18. Johnson, J.E. Attitudes toward play and beliefs about development. In *Cultural Dimensions of Play, Games, and Sport*; Mergen, B., Ed.; Human Kinetics: Champaign, IL, USA, 1986; pp. 89–101.

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