ENCYCLOPEDIA
on Early Childhood
Development

Digital Technology and Play in Early Childhood

Fiona Louise Scott, PhD, MA, BA (Hons), FHEA

The School of Education, Faculty of Social Sciences, The University of Sheffield, United Kingdom

April 2021

Introduction

Young children[1] engage with a broad array of technology including, but not limited to, television, film, internet accessed on any device, video games, tablet or smartphone apps and games and associated artefacts (e.g., books, toys or physical games relating to characters or brands). Play is complex to define[2] and is discussed in diverse ways in different contexts.[3] Many agree that play is distinguished by being fun, freely-chosen, serving its own purpose and being subject to (internal) rules.[4]

Subject

From birth, children have increasing access to a range of digital technologies. This inevitably impacts the landscapes of their play.[5] Since play is universally acknowledged as being important for children, it is necessary to understand the nature of children's play in relation to technology. Families need support for parenting in the digital age[6] and early childhood educators must know how to embed digital technologies in their own professional practice.[7]

Problems

©2021-2026 ABILIO | TECHNOLOGY IN EARLY CHILDHOOD EDUCATION

There are numerous tensions and provocations in the study of young children's digital lives and play. Technology has sometimes been presented as antithetical to play.[2] More recently, the benefits of children's engagements with technology have been recognized, although not always their playful potential. Research has highlighted how specific characteristics of play contribute to children's development and learning[8] and how digital play may serve educative purposes if it is designed with specific learning outcomes in mind.[9] There is a risk that tying digital play's value too closely to a narrow definition of learning might risk ignoring the other crucial functions play fulfils.[2] However, highlighting specific formally educative impacts of digital play might be essential to reversing the trend towards reduced opportunities for play in many education systems.[10]

Research Context

Historically, much experimental, psychological research assumed that technology use by young children was primarily passive, in contrast to the active nature fundamental to children's play. A range of large-scale surveys and qualitative observational studies have summarized digital use in the Global North,[11,12] but play is rarely their primary focus. One recent exception[13] researched five topics related to play with technologies in the UK and South Africa. Recent approaches in smaller scale work have brought new insights into the nature of digital play. Ecological,[14] ecocultural[15] and sociocultural[16,17] studies have considered how social and cultural factors shape digital play. Digital literacies[18] researchers have considered the new and unique forms of play made possible by particular digital contexts.[19]

Key Research Questions

Three questions are considered: (1) which technologies do young children play with and how do they play with them? (2) Is play with technology similar or different to traditional (non-digital) play? (3) What are the implications of digital play for children's development?

Recent Research Results

Recent European,[11,20] Australian[21] and North American[12] data suggest that many young children are growing up in media-rich homes, frequently accessing moving image media[20] and using a range of digital technologies.[22] Use continues to diversify: young children spend increasing time using smartphones and tablets,[12] while smart speakers have recently emerged as important.[20] Diversification inevitably invites previously undocumented examples of play, such as children

asking smart speakers to count to 10 while they play hide-and-seek.[13] Such examples show that digital contexts do not limit the types of play that are possible; rather, the precise nature of play changes.[23] Many studies have focused on 'screen time' as a displacement of time that might be better spent on 'real world' activities including non-digital play.[24,25] However, play is one of the primary ways that children use their digital devices.[5]

The precise nature of that play is complex and contested, having sometimes been criticized as 'less than' traditional play, constraining creativity[26] or limiting social interaction.[27,28] Certain digital contexts are viewed as less playful, such as television watching, when compared to applications on tablets,[5] smartphones and consoles.[29] Scholarly observations counter these commonly held perceptions. For example, children carry the narrative themes of television into their imaginative play.[30] Empirical work has highlighted children's highly creative play with computer games, apps, digital cameras, coding toys and more.[5,31,32] Meanwhile, numerous sources [13,33] document the social nature of young children's play with technologies. The social contexts of children's digital engagement also play an important role.[29,34] Parents and carers have been shown to support the development of particular skills by engaging with their children's digital play,[35,36] although children's free-play with technology also holds important benefits.[13] Analyses of children's play with technologies suggest that all of the play types[37] typical in non-digital play can also be found in their digital play.[23]

Implications for young children are complex. Children develop a wide range of skills through their digital play,[13] including: subject knowledge and understanding; digital skills; and holistic skills (social, emotional, cognitive, physical and creative). Research has called attention to a range of social, cultural, political and economic issues associated with digital play. A recent study highlighted disparities in relation to digital play in the Global North and South.[13] For example, South African children spent less time playing titles such as Minecraft, Roblox and Fortnite than their UK counterparts. Studies suggest that girls and boys sometimes make different digital play choices.[38,39] Certain types of play with digital technologies, such as play based on adult television[40] or playing 'shooter' video games,[41] have been constructed as deficit or even dangerous, as in the case of the digital play of African American boys.[42] While there is a need to support children in using technology safely, a wide range of play practices hold value in diverse ways, not least in relation to identity formation.[43] There are, then, risks associated with the narrow value judgements sometimes implicit in formal education, if some young children's play practices are embraced and expanded upon in the classroom, while other types of play are

discouraged.[29] The commercialization of children's play with digital technologies has been subject to long-standing critical review,[44] with recent work highlighting issues related to features of video game play, such as 'loot boxes'.[45]

Research Gaps

Much research concerns older children (9-16 years).[11] There is a lack of empirical work focused on the youngest children (0-2 years), although exceptions exist.[46] There is a need for device and platform specific research focused on the play afforded by emerging technologies, for example Augmented[32] and Virtual[47] Reality. Much has focused on the skills and knowledge acquired through digital play and specifically in relation to self-styled educational technologies.[25] However, there is also a need to research children's play holistically across a broad range of digital and non-digital contexts,[48] particularly as the presence of the digital in everyday life is such that it is no longer feasible to distinguish between the oft intertwined digital and non-digital.[49] Research should consider broad benefits of play beyond the formally educative. Given the diverse daily life-worlds of children, there is a need for more research across geographical contexts beyond the Global North,[5,50] particularly the Global South.

Conclusions

Children's play in relation to digital technologies is at once similar to non-digital play and distinct from it. Scholars have mapped traditional play types against digital play and found that all are represented. However, digital contexts afford previously undocumented examples of play worthy of study in their own right. The digital and non-digital are intertwined in young children's lives and it is thus useful to consider play more holistically. Ongoing research is needed to deepen knowledge and understanding of the precise nature of young children's play in relation to the digital - both generally and more specifically in relation to the identified gaps in knowledge.

Implications for Parents, Services and Policy

Much information for parents and carers warns of potential harms and provides guidance on how to mitigate the risks of children's technology use. The research reviewed here suggests that a greater emphasis on the possible benefits is warranted. Families need information about how best to support and mediate their children's play with digital devices. The benefits of children's solo free-play with technologies can also be highlighted. The value of digital play for developing specific knowledge as well as physical, social, emotional and creative skills should be

communicated to families and early childhood professionals.

Digital play is often ignored in early years policy, yet it holds value for learning and contributes meaningfully to young children's lives in broader ways. Policy-makers must attend to digital play, and in a way that is representative of a broad range of play practices. Training programs for early years educators would benefit from some consideration of how educators can build productively on children's home digital play practices.

References

1. Farrell A, Kagan SL, Tisdall EKM. Early childhood research: An expanding field. In: Farrell A, Kagan SL, Tisdall EKM, eds. The SAGE handbook of early childhood research. Los Angeles, USA: SAGE; 2015:1-12.
2. Scott F. Troublesome binaries: Play and learning on screen and off. In: Smith PK, Roopnarine, JL, eds. *The Cambridge handbook of play: Developmental and disciplinary perspectives*. Cambridge, United Kingdom: Cambridge University Press; 2018:240-257.
3. Sutton-Smith B. *The ambiguity of play*. Cambridge, Mass.: Harvard University Press; 1997.
4. Eberle SG. The elements of play: Toward a philosophy and a definition of play. *American Journal of Play*. 2014;6(2):214-233. Accessed March 1, 2021. https://files.eric.ed.gov/fulltext/EJ1023799.pdf.
5. Marsh J, Plowman L, Yamada-Rice D, Bishop JC, Lahmar J, Scott F, Davenport A, Davis S, French K, Piras M, Thornhill S, Robinson P, Winter P. Exploring play and creativity in pre-schoolers' use of apps: Final project report. 2015. http://www.techandplay.org/reports/TAP_Final_Report.pdf. Accessed March 1, 2021.
6. Livingstone S, Blum-Ross A, Pavlick J, Ólafsson K. *In the digital home, how do parents support their children and who supports them? Parenting for a Digital Future: Survey Report 1*. 2018. Accessed March 1, 2021. https://www.lse.ac.uk/media-and-communications/assets/documents/research/preparing-for-a-digital-future/P4DF-Survey-Report-1-In-the-digital-home.pdf.
7. Marsh J, Kontovourki S, Tafa E, Salomaa S. *Developing digital literacy in early years settings: professional development needs for practitioners. A White Paper for COST Action IS1410*. 2017. Accessed March 1, 2021. http://digilitey.eu/wp-content/uploads/2017/01/WG2-LR-jan-2017.pdf.
8. Jensen H, Pyle A, Zosh JM, Ebrahim HB, Zaragoza Scherman A, Reunamo J, Hamre BK. *Play facilitation: the science behind the art of engaging young children (white paper)*. Billund, DK; The LEGO Foundation; 2019. Accessed March 1, 2021. https://www.legofoundation.com/media/1681/play-facilitation_the-science-behind-the-art-of-engaging-young-children.pdf.
9. Paraskeva F, Mysirlaki S, Papagianni A. Multiplayer online games as educational tools: Facing new challenges in learning. *Computers & Education*. 2010;54(2):498-505. doi:10.1016/j.compedu.2009.09.001.
10. Jay JA, Knaus M. Embedding play-based learning into junior primary (Year 1 and 2) curriculum in WA. *Australian Journal of Teacher Education*. 2018;43(1):112-126.
11. Chaudron S, Di Gioia R, Gemo M. *Young children (0-8) and digital technology, a qualitative study across Europe, EUR 29070 EN*. Publications Office of the European Union, Luxembourg, 2017. doi:10.2760/294383
12. Rideout, V. *The Common Sense census: Media use by kids age zero to eight*. San Francisco, CA: Common Sense Media; 2017.
13. Marsh J, Murris K, Ng'ambi D, et al. *Children, technology and play*. Billund, DK; The LEGO Foundation: 2020. Accessed March 1, 2021. https://www.legofoundation.com/media/2965/children-tech-and-play_full-report.pdf.

14. Arnott L. An ecological exploration of young children's digital play: framing children's social experiences with technologies in early childhood. *Early Years*. 2015;36(3):271-288. doi:10.1080/09575146.2016.1181049.

15. Plowman L. Rethinking context: Digital technologies and children's everyday lives. *Children's Geographies*. 2016;14(2):190-202. doi:10.1080/14733285.2015.1127326.

16. Bird J, Edwards S. Children learning to use technologies through play: A Digital Play Framework. *British Journal of Educational Technology*. 2015;46(6):1149-1160. doi:10.1111/bjet.12191.

17. Edwards S. Lessons from 'a really useful engine'™: using Thomas the Tank Engine™ to examine the relationship between play as a leading activity, imagination and reality in children's contemporary play worlds. *Cambridge Journal of Education* . 2011;41(2):195-210. doi:10.1080/0305764X.2011.572867.

18. Scott FL, Marsh, JA. Digital literacies in early childhood. In: Noblit GW, Adams N, Beach D, et al., eds. *The Oxford Research Encyclopedia of Education*. Oxford: Oxford University Press; 2018. doi:10.1093/acrefore/9780190264093.013.97

19. Steinkuehler, C. Video games and digital literacies. *Journal of Adolescent & Adult Literacy*. 2010;54(1):61-63. doi:10.1598/JAAL.54.1.7.

20. Ofcom. Children and parents: Media use and attitudes report. 2019. Accessed March 1, 2021. https://www.ofcom.org.uk/__data/assets/pdf_file/0023/190616/children-media-use-attitudes-2019-report.pdf.

21. Australian Bureau of Statistics. Participation in Selected Cultural Activities. 2019. Accessed March 1, 2021. https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4921.02017-18?OpenDocument.

22. Holloway D, Green L. The Internet of Toys. *Communication Research and Practice*. 2016;2(4):506-519. doi:10.1080/22041451.2016.1266124.

23. Marsh J, Plowman L, Yamada-Rice D, Bishop J, Scott F. Digital play: A new classification. *Early Years*. 2016;36(3):242-253. doi:10.1080/09575146.2016.1167675

24. Wartella E, Beaudoin-Ryan L, Blackwell CK, Cingel DP, Hurtwitz LB, Lauricell AR. What kind of adults will our children become? The impact of growing up in a media-saturated world. *Journal of Children and Media*. 2016;10(1):13-20. doi:10.1080/17482798.2015.1124796

25. Stephen C, Plowman L. Digital Play. In: Brooker L, Blaise M, Edwards S, eds. SAGE Handbook of Play and Learning in Early Childhood, London: SAGE; 2014:330-341.

26. Singer D, Singer J. 2005. Imagination and Play in the Electronic Age. Cambridge, Massachusetts: Harvard University Press; 2005.

27. Donohue C. Technology and digital media as tools for teaching and learning in the digital age. In: Donohue C, ed. *Technology and digital media in the early years: Tools for teaching and learning*. Routledge, New York, NY; 2015:21-35.

28. Moore HL, Adair JK. "I'm just playing iPad": Comparing prekindergarteners' and preservice teachers' social interactions while using tablets for learning. *Journal of Early Childhood Teacher Education*. 2015;36:362–378. doi:10.1080/10901027.2015.1104763.

29. Scott F. Young children's engagement with television and related media in the digital age. [PhD thesis]. Sheffield, UK: The University of Sheffield; 2018. Accessed March 1, 2021. https://etheses.whiterose.ac.uk/22928/1/Scott_F_PhD_Thesis_LibraryCopy.pdf.

30. Marsh J. The techno-literacy practices of young children. *Journal of Early Childhood Research*. 2005;2(1):51-66. doi:10.1177/1476718X0421003

31. Bolstad R. *The role and potential of ict in early childhood education: A review of New Zealand and international literature*. 2004. Accessed March 1, 2021. https://www.nzcer.org.nz/system/files/ictinecefinal.pdf.

32. Scott F, Marsh J. Young children's engagement and learning with the augmented reality (AR) coding app 'Little Red Coding Club': Research report. 2019. Accessed March 1, 2021. https://content.twinkl.co.uk/document/general/twinkl-

childrens-learning-with-ar-fnl-28-10-19_1578567254.pdf.

33. Freeman NK, Somerindyke J. Social play at the computer: Preschoolers scaffold and support peers' computer competence. *Information Technology in Childhood Education Annual*. 2001;1:203-213. Accessed March 1, 2021. http://www.learntechlib.org/p/8490/.
34. Stephen C., Stevenson O, Adey C. Young children engaging with technologies at home: The influence of family context. *Journal of Early Childhood Research*. 2013;11(2):149-164.
35. Plowman L, McPake J, Stephen C. Just picking it up? Young children learning with technology at home. *Cambridge Journal of Education*. 2008;38(3):303-319.
36. Flynn RM, Richert RA. Parents support preschoolers' use of a novel interactive device. *Infant and Child Development*. 2015;24:624-642. doi:10.1002/icd.1911.
37. Hughes, B. *A Playworker's Taxonomy of Play Types*. 2nd ed. London: PlayLink; 2002.
38. Golding D, Van Deventer L. *Game changers: From Minecraft to misogyny, the fight for the future of videogames*. Melbourne, VIC, Australia: Affirm Press; 2016.
39. Kafai YB. *Beyond Barbie and Mortal Kombat: New perspectives on gender and gaming*. Cambridge, MA: The MIT Press; 2008.
40. Marsh J, Bishop J. We're playing Jeremy Kyle'! Television talk shows in the playground. Discourse: Studies in the Cultural *Politics of Education*. 2014;35(1):16-30.
41. Anderson CA, Sakamoto A, Gentile DA, et al. Longitudinal effects of violent video games on aggression in Japan and the United States. *Pediatrics*. 2008;122(5):1067-1072.
42. Lewis Ellison T, Solomon M. Digital play as purposeful productive literacies in African American boys. *The Reading Teacher*. 2017;71(4):495–500. doi:10.1002/trtr.1657.
43. Gee, JP. *What do video games have to teach us about learning and literacy?* New York, NY: Palgrave/Macmillan; 2003.
44. Grimes S. Playing by the market rules: Promotional priorities and commercialization in children's virtual worlds. *Journal of Consumer Culture*. 2015;15(1):110-134. doi:10.1177/1469540513493209.
45. Macey J, Hamari J. eSports, skins and loot boxes: Participants, practices and problematic behaviour associated with emergent forms of gambling. *New Media & Society*. 2019;21(1):20-41. doi: 10.1177/1461444818786216.
46. Gillen J et. al. *A day in the digital lives of children aged 0-3. Summary report by DigiLitEY ISCH COST Action IS1410 Working Group 1 "Digital literacy in homes and communities."* 2018. Accessed March 1, 2021. http://digilitey.eu/wp-content/uploads/2018/06/DigiLitEY-A-Day-in-the-Digital-Lives-FINAL.pdf.
47. Yamada-Rice D., Mushtaq F, Woodgate A, Bosmans D. *Children and virtual reality: Emerging possibilities and challenges*. 2017. Accessed March 1, 2021. http://digilitey.eu/wp-content/uploads/2015/09/CVR-Final-PDF-reduced-size.pdf.
48. Parry B, Scott F. Researching children's play and identity in the digital age. In: Erstad O, Flewitt R, Kümmerling-Meibauer B et al., eds. *The Routledge handbook of digital literacies in early childhood*. Routledge; 2019.
49. Jayemanne D, Apperley TH, Nansen B. Postdigital interfaces and the aesthetics of recruitment. *Transactions of the Digital Games Research Association*. 2016;2(3):145-172. doi:10.26503/todigra.v2i3.56.
50. Rideout VJ, Robb MB. *The Common Sense Census: Media use by kids age zero to eight*. San Francisco, CA: Common Sense Media; 2020. Accessed March 1, 2021. https://www.commonsensemedia.org/sites/default/files/uploads/research/2020_zero_to_eight_census_final_web.pdf.