

EECERA 2026 | 25 - 28 August, Madeira

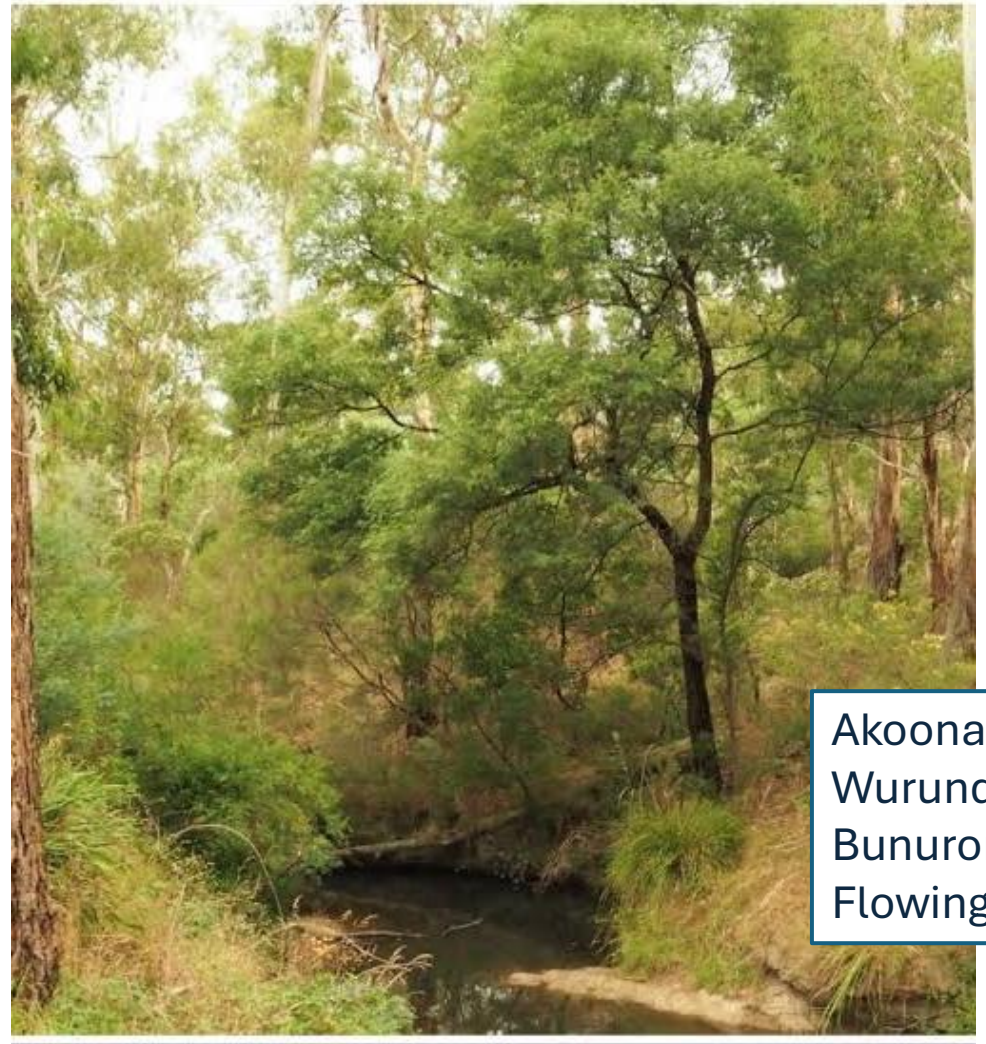
Advancing Children's Participation in The Digital Age through Philosophy of Technology

Professor Susan Edwards





Naarm
Wurundjeri
Melbourne



Akoonah Park
Wurundjeri
Bunurong
Flowing water

Acknowledgements

ARC Linkage 2019–2024

‘Young Children in Digital Society’

Investigators

Susan Edwards, Leon Straker, Andrea Nolan, Michael Henderson, Sue Grieshaber, Kate Highfield, Andi Salamon, Helen Skouteris

Industry partners

Alannah and Madeline Foundation, ABC Kids, Australian Federal Police, Early Childhood Australia, eSafety Commissioner, Project Synthesis, Raising Children Network

Advisory board

Lydia Plowman, Andrew Feenberg, Susan Danby, Amanda Third, Anthea Rhodes

PhD candidates

Honor Mackley, Jane Caughey

Research assistants

Sydnye Allen, Jacinta Bartlett, Rani Bovopoulus, Jane Caughey, Pamela Lambert, Honor Mackley, Deborah Moore, Sarah Mullin, Louisa Scott, Hamsini Sivaramakrishnan, Spero Tsindos, Juliana Zabertierio

ARC Centre of Excellence for the Digital Child 2022–2023 supported project

‘Teacher understandings of digital play’

Investigators

Louise Paatsch, Susan Edwards, Lisa Kervin

Research fellow

Celine Chu

Collaborators

Jacqui Jarvis, Martin Thomson, Courtney Mogensen, Claire Lay, Nichola Mead

Research assistant

Honor Mackley

ARC Discovery 2025–2028

‘AI for the Early Years’

Investigators

Susan Edwards, Michael Henderson, Jane Page, Amanda Third, Andrew Manches, Sherri Hope Culver, Victoria Minson, Kelly Humphrey

Research fellow

Jane Caughey

Collaborators

Melanie Thomas, Audrey Juma, Merten Reglitz, Emmanouela Terlektsi

Industry partners

ABC Kids, Education Services Australia, Australian Federal Police, Raising Children Network, Early Childhood Australia, eSafety Commissioner

PhD candidates

Yifei Wang, Jiaqi Liang, Karen Hope, Annie Hu, Jinhua Wang

Research assistants

Alex Heard, Jiaqi Liang, Yifei Wang, Louisa Scott, Tag Yassine, Omair Al-Baghdadi, Petrea Cahir, Katie Acheson



What is the digital age?

Why philosophy of technology?

How can we enable democratic participation?

Young Children Playing and Learning in a Digital Age

a Cultural and Critical Perspective

Christine Stephen
and Susan Edwards



2017

Towards an
Ethical Praxis in
Early Childhood

EECERA
European Early Childhood
Education Research Association

ROUTLEDGE

What is the digital age?

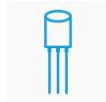


From industrialism

Mass production replaced by information and data as core resource

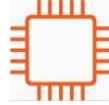
1800s–1940s

1947



The transistor

Invention of transistor means electricity can flow through semi-conductors



The microchip

Microprocessors put binary switching on a chip – marking the emergence of the ‘digital’

1971

1989–91



The World Wide Web

Networked communication evolves from point-to-point communication; Berners-Lee proposes WWW



The internet of things

Everyday objects connect and exchange data creating a digital infrastructure

Post-2000

2010



Tablet computing

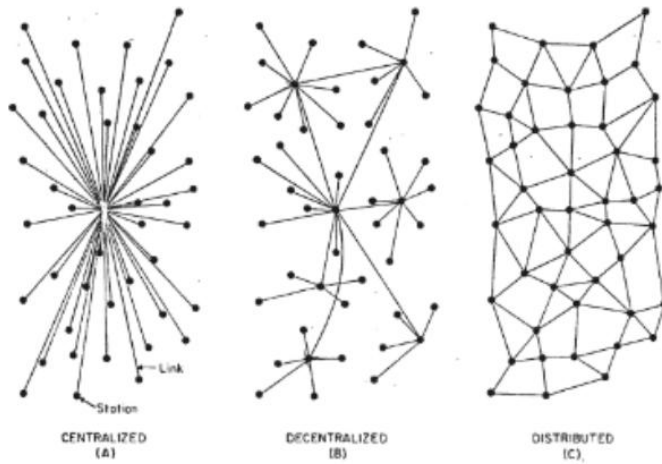
Touchscreens increase accessibility of internet beyond mouse and keyboard



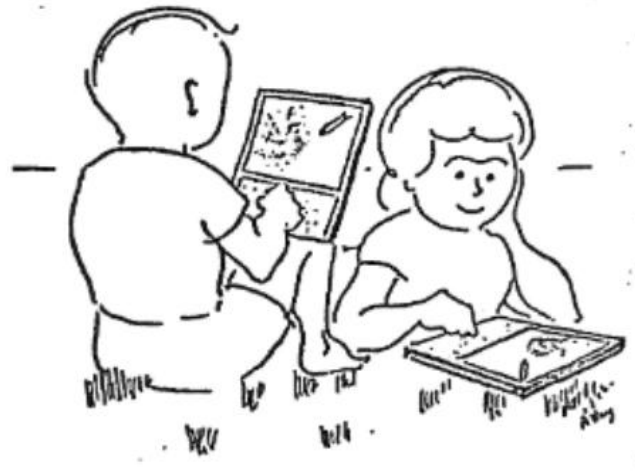
Smart, AI-driven devices

Voice activation and AI make devices responsive and personalised

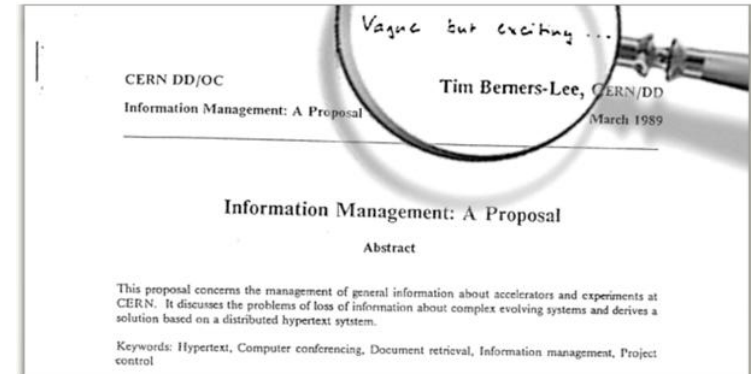
2020s



Baran 1962 original sketch showing three different communication systems
Leading to the internet



Alan Kay 1972 original Dynabook sketch
Leading to the iPad



“The mesh”

Tim Berners-Lee 1989 original proposal on information management at CERN
Leading to the World Wide Web

Where are we now?



Generation 1
1980–2010
To use or not to use

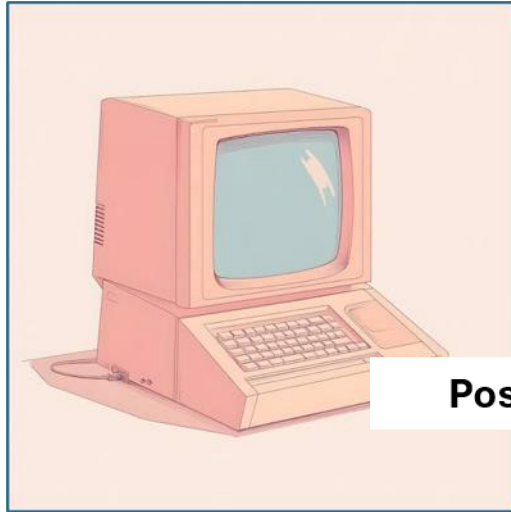


Generation 2
2010–2020
Digital Play



Generation 3
2020–2026
Post-digital

Edwards, S. (2023). Concepts for Early Childhood Education and Care in the Postdigital. *Postdigital Science and Education* **5**, 777–798.
<https://doi.org/10.1007/s42438-022-00356-7>



From offline and dial up



Post-digital imbrication of digital, social, biological (Jandrić & Knox, 2022)



To online and Wi-Fi



Generation 3
2020-2026
Post-digital



Generation 4
2026-20XX
Meta-digital?

Why philosophy of technology?

Post-digital to meta-digital: ongoing complexities

Data and power

Datafication of childhood
Learning analytics
Commercial content in media, toys and play

Safety and wellbeing

Content and contact risks
Sharenting and consent
SEL, sleep and physical activity

Equity and recognition

Cultural under-representation
Global South/North
Inclusive education

Planet and sustainability

Energy, water and data centres
Extractive supply chains
Electronic waste

Rights and participation

Equitable digital access
Play and digitality
Misinformation
Indigenous knowledges



Generation 3
2020-2026
Post-digital



Generation 4
2026-20XX
Meta-digital

What theoretical perspectives are evident?

ORIGINAL MANUSCRIPT

Children & Society WILEY

Young children's agency with digital technologies

Andrea Nolan¹ | Susan Edwards² | Andi Salamon³ |
Leon Straker⁴ | Susan Grieshaber⁵ | Helen Skouteris^{6,7} |
Michael Henderson⁸ | Kate Highfield⁹ | Jacinta Bartlett¹⁰

19 papers

Young children's agency (Nolan et al., 2022)

- 8 impact of technologies
- 11 adult management of technologies
- 10 developmental
- 9 sociocultural
- 3 theorisation of the digital (critical)

Contents lists available at ScienceDirect

ELSEVIER

International Journal of Child-Computer Interaction

journal homepage: www.elsevier.com/locate/ijcci

Research Paper

Digital play in the early years: A systematic review

Celine Chu^{a,*}, Louise Paatsch^b, Lisa Kervin^c, Susan Edwards^d

118 papers

Digital play: systematic review (Chu et al., 2024)

- 110 affordance for digital play
- 82 features of digital play (learning, developmental, situated, enjoyable, interactive, entertaining, meaningful, gendered)
- 8 concerns about digital play
- Little to no theorisation

Contents lists available at ScienceDirect

ELSEVIER

International Journal of Educational Research Open

journal homepage: www.elsevier.com/locate/ijedro

AI Pedagogies and AI Literacies for Early Childhood Education and Care

Susan Edwards^{a,*}, Jane Caughey^a, Michael Henderson^c, Andrew Manches^d,
Sherri Hope Culver^e, Jane Page^f, Amanda Third^g, Victoria Minson^h, Kelly Humphreyⁱ

21 papers

AI pedagogies and AI literacies (Edwards et al., 2026)

- AI Pedagogies (10): 3 sociocultural, 1 screen mediation
- 6 no theory of learning or technology
- AI Literacies (11): 2 sociocultural, 2 constructionism, 1 learning sciences
- 6 no theory of learning or technology

Across 158 papers: minimal theoretical perspectives on technology

Post-digital to meta-digital: ongoing complexities

Data and power

Datafication of childhood
Learning analytics
Commercial content in media, toys and play

Safety and wellbeing

Content and contact risks
Sharenting and consent
SEL, sleep and physical activity

Equity and recognition

Cultural under-representation
Global South/North
Inclusive education

Planet and sustainability

Energy, water and data centres
Extractive supply chains
Electronic waste

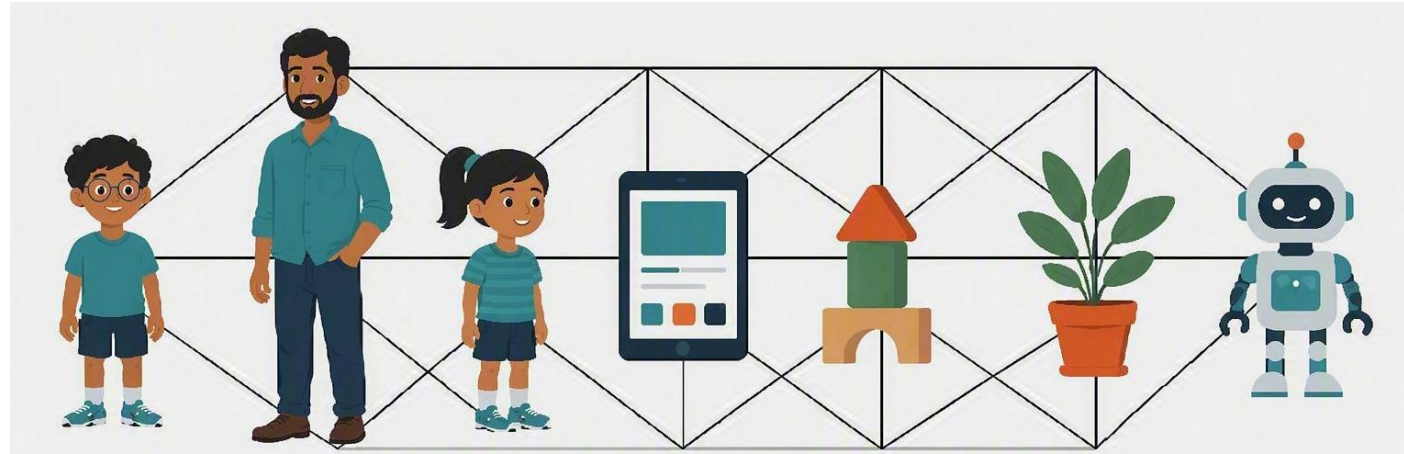
Rights and participation

Equitable digital access
Play and digitality
Misinformation
Indigenous knowledges

situated • developmental • interactive • learning • entertaining • enjoyable • meaningful • gendered

Additional perspectives

Sociomaterialism | Post-humanism | Actor Network Theory



- Burnett, C., Merchant, G., & Neumann, M. M. (2020). Closing the gap? Overcoming limitations in sociomaterial accounts of early literacy. *Journal of Early Childhood Literacy*, 20(1), 111–133.
- Lafton, T. (2015). Digital literacy practices and pedagogical moments: Human and non-human intertwining in early childhood education. *Contemporary Issues in Early Childhood*, 16(2), 142–152.
- Luo, W., Gao, M., Liu, J., Berson, I., Berson, M., & Li, H. (2026). The illusion of agency: Deconstructing AI's influence on the generation of authentic agency in early childhood. *AI, Brain and Child*, 2(1), 17–30.
- Murriss, K. (2023). 'This is not a photograph of Zuko': How agential realism disrupts child-centred notions of agency in digital play research. *Children's Geographies*, 21(3), 547–562.
- Pettersen, K., Arnseth, H. C., & Silseth, K. (2022). Playing Minecraft: Young children's postdigital play. *Journal of Early Childhood Literacy*, 25(1), 133–157.
- Sørenssen, I. K. (2024). Exploring enactments of the big screen and the small screen in a Norwegian early childhood education and care setting. *Contemporary Issues in Early Childhood*, 25(4), 460–478.

Socio-materialism, post-humanism and actor network theory decentre the role of the child in social-material-digital networks

A challenge in the digital age is how to advance children's democratic participation

Rather than decentre the human, philosophy of technology seeks to understand the child in *relationship* with technologies and society

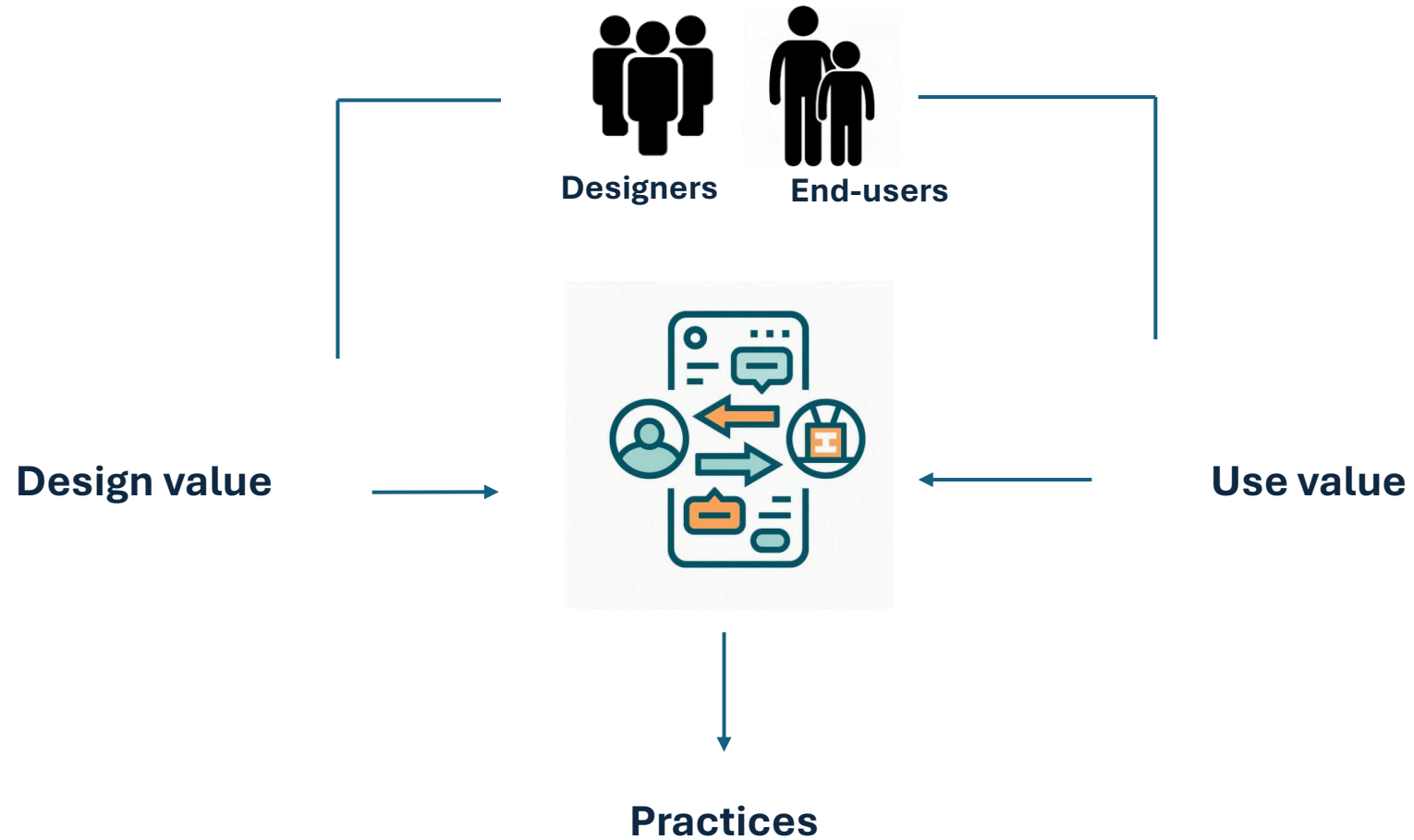


Technological determinism

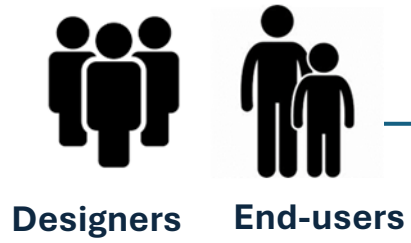


Critical constructivism

Critical constructivism

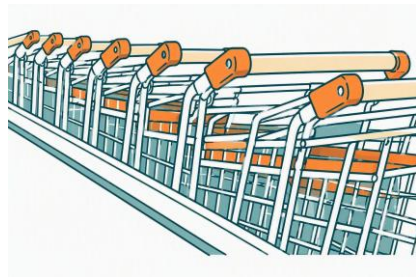


Feenberg, A. (2009). What is philosophy of technology? In *International handbook of research and development in technology education* (pp. 159–166). Brill.



Informs technical specifications according to problem

Design value

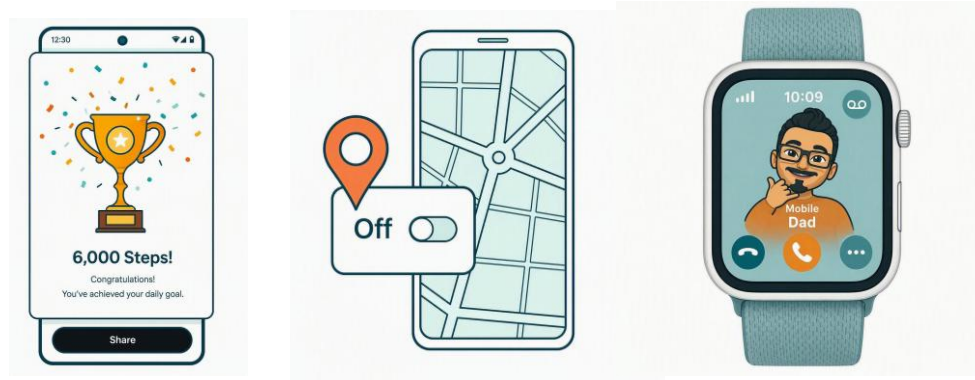
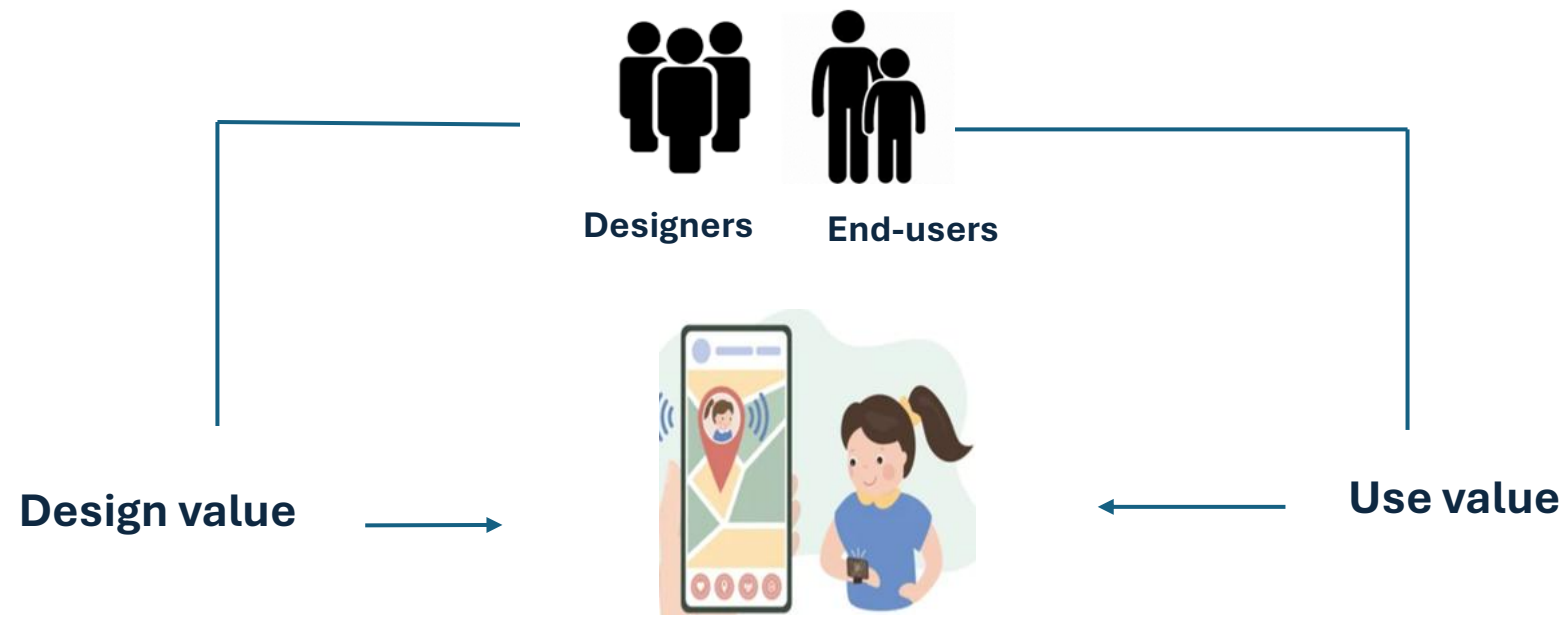


Use value

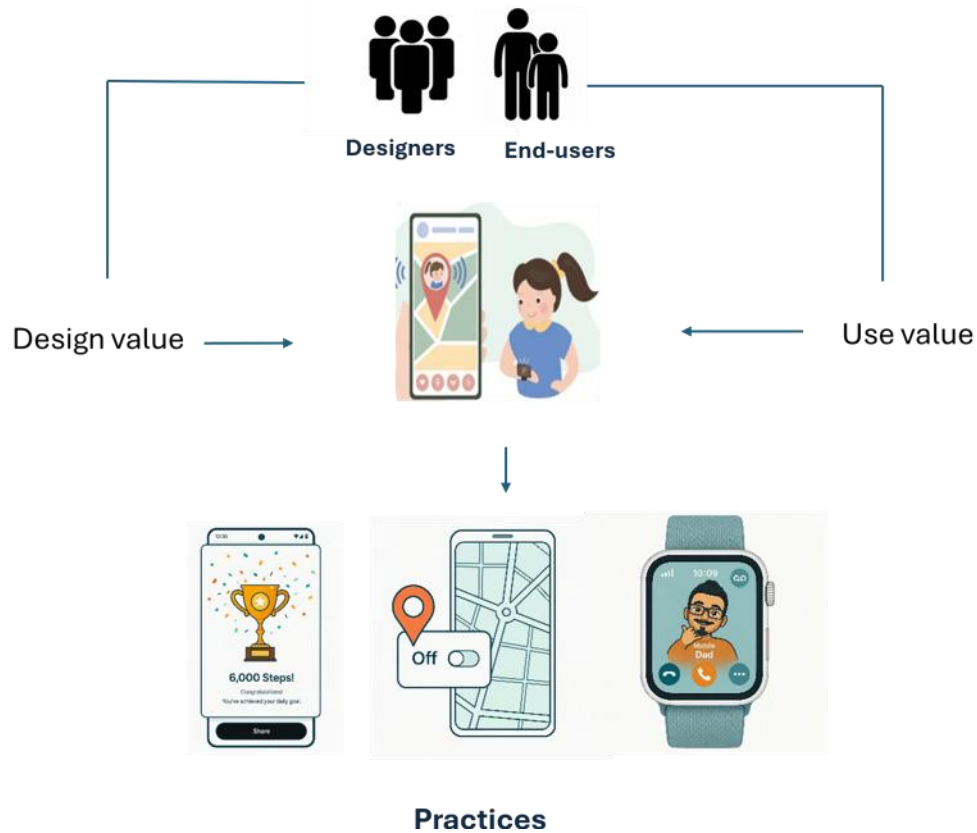
Lands in a community of practice; Existing knowledge, beliefs, values



Practices



Practices



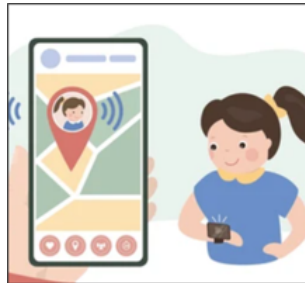
“Because critical constructivism focuses specifically on the role of operational autonomy (practices), it is concerned with those aspects of change related to the power dynamics in the technosystem ... the demand for **democratization is a claim for the extension and formal recognition of these contributions of non-experts**, not a rejection of the role of expertise” (Feenberg, 2020)



Democratic participation in the digital

We have been here before ...

“**Democratic participation** is an important criterion of citizenship: it is a means by which children and adults can participate with others in shaping decisions affecting themselves, groups of which they are members and the wider society. It is also a means of resisting power and its will to govern, and the forms of oppression and injustice that arise from the unrestrained exercise of power. Last but not least, democracy creates the possibility for diversity to flourish. By so doing, it offers the best environment for the production of “**new thinking and new practice**” (Moss, 2007, p. 7).



Generation 3
2020-2026
Post-digital

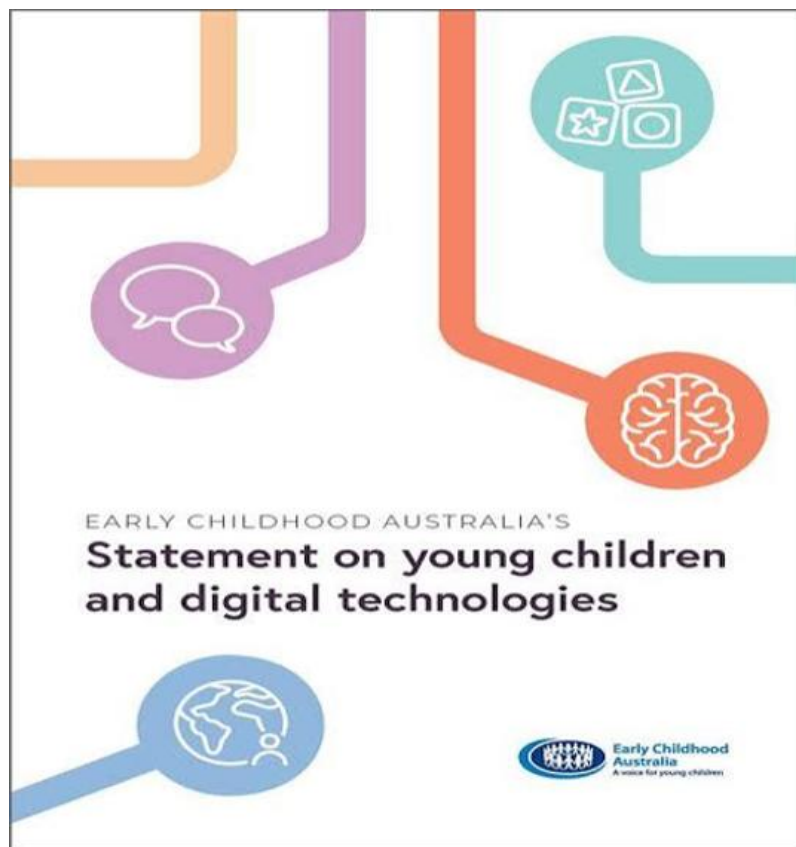
————— **new thinking and new practice** —————→



Generation 4
2026-20XX
Meta-digital



“How **local cultural projects of childhood** can be actively encouraged, what other conditions they need to flourish and what structures and processes may sustain them are all important subjects for research into democratic practice in early childhood education” (Moss, 2007, p. 11).



A Statement on young children and digital technologies can benefit the early childhood sector by providing an evidence base on which educators can make decisions regarding young children and digital technologies that are relevant to the digital contexts experienced by children and their families. Instead of applying 'one-size-fits-all' advice, a decision-making approach recognises that early childhood educators are skilled at working in partnership with children, families and community in the best interests of the child.



Young Children in Digital Society

Now and into the Future

Edited by Susan Edwards
and Leon Straker



<i>Investigation and research question</i>	<i>Industry partners</i>	<i>Participating organisations</i>	<i>Participants</i>
Relationships <i>What characterises infant and toddler peer-to-peer interactions using digital technologies?</i>	Raising Children Network Early Childhood Australia	We Belong Family Day Care	5 Family Day Care Educators and 30 children aged 8 to 36 months
Health and Wellbeing <i>How do families mediate technologies for optimal physical activity in the early years?</i>	Raising Children Network ABC Kids	Playgroup Western Australia	13 Families with at least one child aged between 15 and 36 months
Citizenship <i>Does play-based learning about the internet help prepare children for learning about cyber-safety?</i>	Australian Federal Police Alannah and Madeline Foundation eSafety Commissioner	Lady Gowrie Tasmania Catholic Early EduCare Pope Road Kindergarten Berwick and District Woodworkers Club	6 Long Day Care Educators and 34 children aged 3 to 4 years 6 Kindergarten educators and 40 children aged 4 to 5 years
Play and Pedagogy <i>How does classroom access to technologies influence educator provision of digital play activities?</i>	Early Childhood Australia Project Synthesis	Creche and Kindergarten Association QLD	10 Kindergarten teachers and 15 children aged 3 to 4 years

Australian Research Council Linkage Project
2019-2024

How can we enable democratic participation?





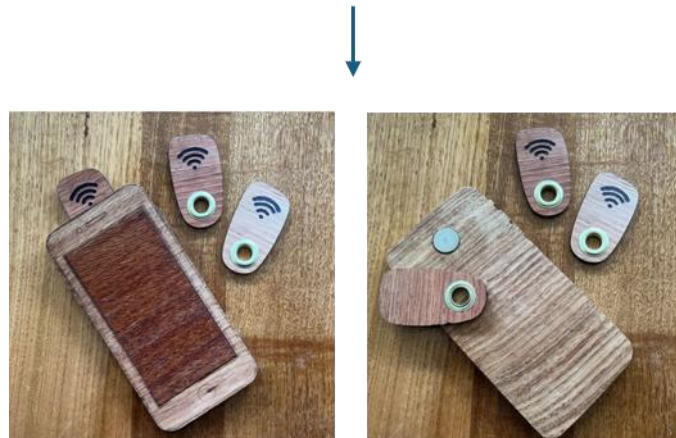
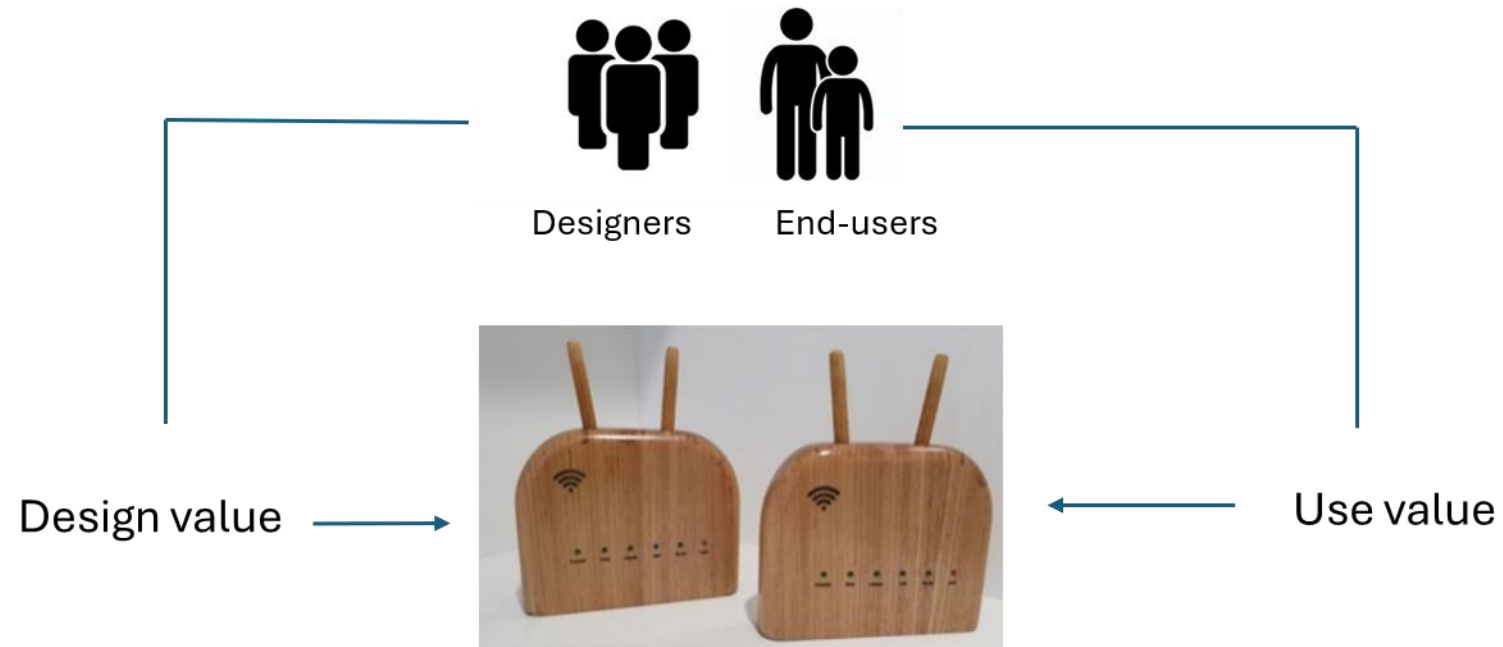
Leave phone to charge

Practices

When the woodworkers came to kindergarten



“The child is understood as a competent citizen, an expert in her own life, having opinions that are worth listening to and having the right and competence to participate in collective decision making. It is important to recognise, too, that children (and adults) have a hundred languages to express themselves, and democratic practice means being able to ‘listen’ to these many languages” (Moss, 2007, p. 13).



Mobile, social
Practices

Connect to Wi-Fi to send and receive data

Search for information about areas of investigation

What to do with phones at lunch time?



Consider tone of voice when talking via devices

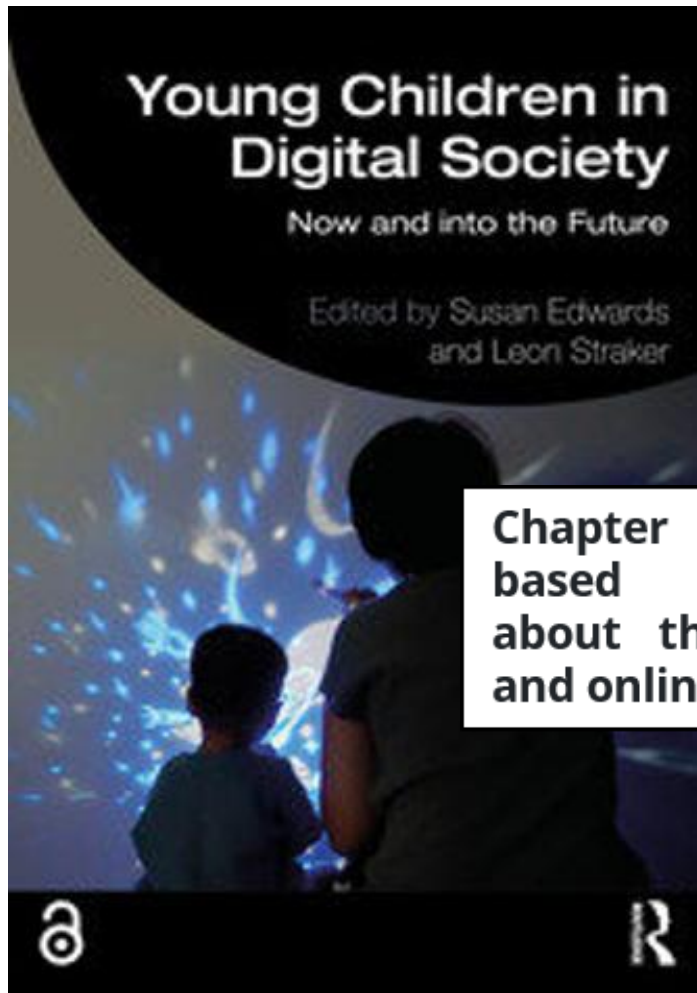
Check consent for taking photographs

Order and exchange money for goods and services

children



adults

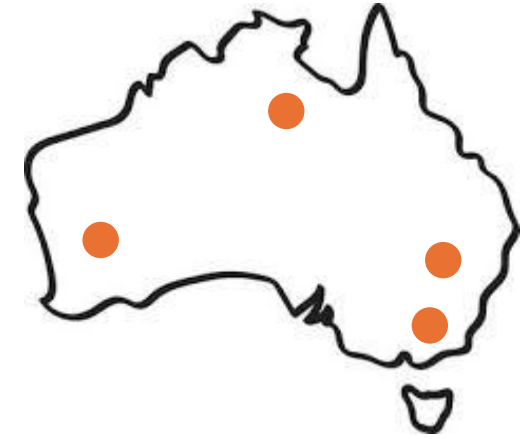


Chapter 7: Play-based learning about the internet and online safety

Chapter Seven examines how educators support young children's understanding of online safety and respectful digital participation through play-based strategies that translate abstract civic concepts into developmentally accessible experience. Notably, the chapter introduces a participatory innovation in the form of a wooden Wi-Fi model, a material artifact designed to make the invisible infrastructure of the internet imaginatively tangible for young children. This kind of creative pedagogical invention speaks to the broader claim of the volume that effective **digital education requires not restriction but imaginative re-framing** (Zakariyah & Lestari, 2026, p. 2)

Artificial Intelligence (AI) for the Early Years

Australian Research Council Discovery Project 2025-2028



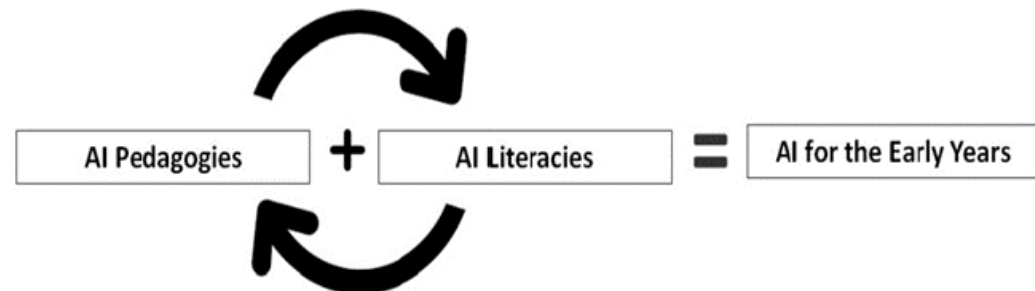
1. Exploring AI Pedagogies and AI Literacies with children, families and teachers to identify practices
2. Sharing children, families and teachers' practices with experts (inclusion, culture, ethics, safety)
3. Checking experts thinking about practices with children, families and teachers
4. Engaging national organisations to see how practices align with strategic directions
5. Co-writing an AI for the Early Years statement for families, educators/teachers and digital designers

AI in Education (AI Pedagogies)

AI in used in learning and teaching

AI and Education (AI Literacies)

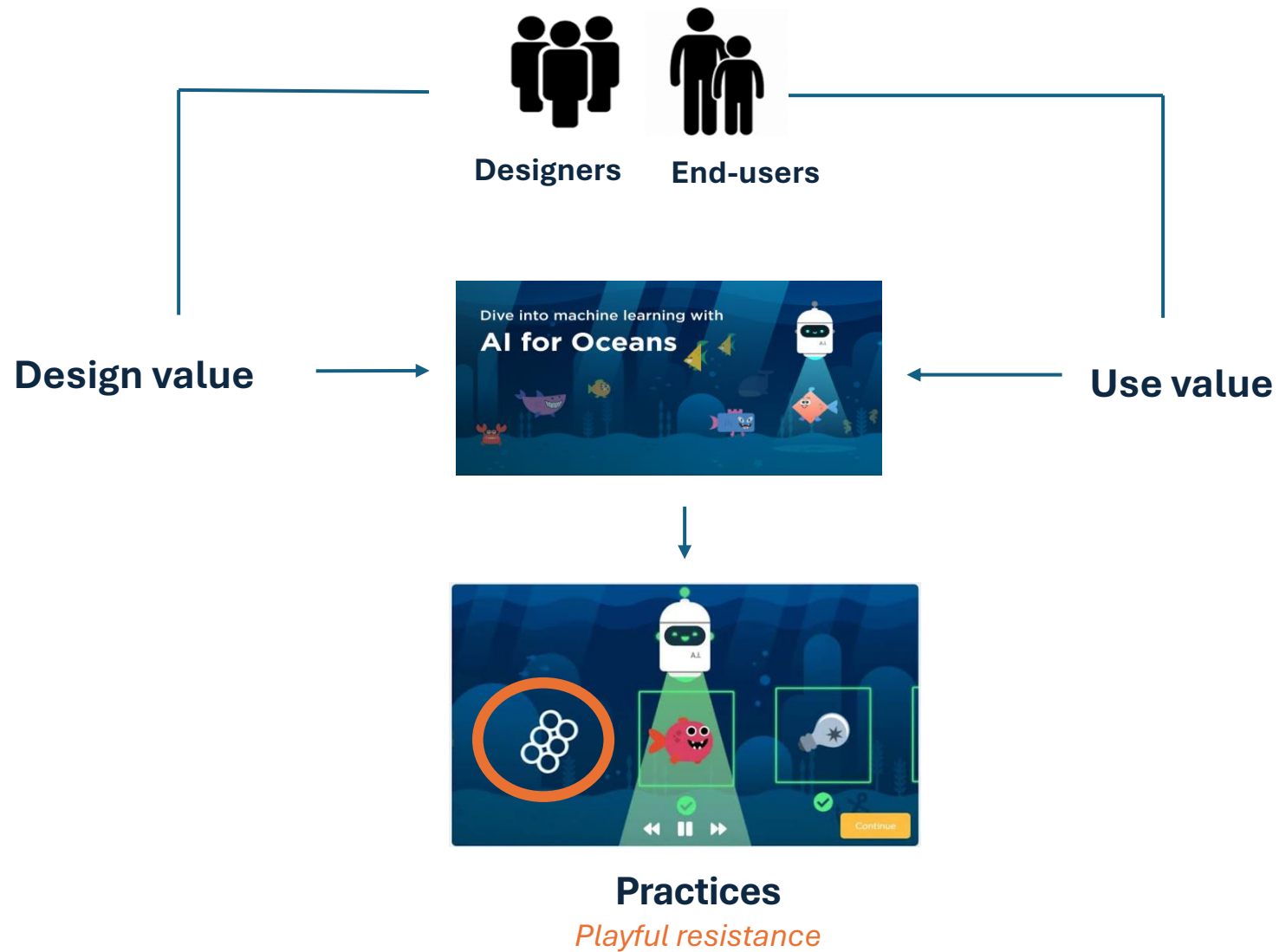
Learning about and understanding AI



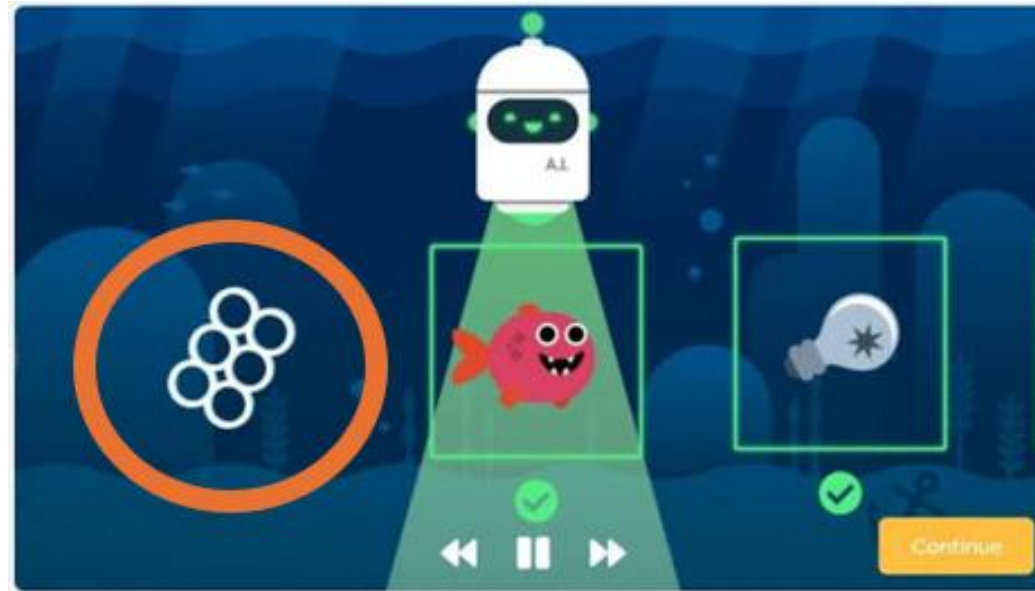
Dive into machine learning with

AI for Oceans





“Play [as resistance] embodies an implicit critique of reality and provides an opportunity for people to reflect upon and evaluate the apparent inevitability of existing social relations” (King, 1982, p. 321)



“The children challenged the design assumption built into AI for Oceans that they would train the AI as prescribed ... AI does not have to be as it seems” (Edwards, et al., under review)

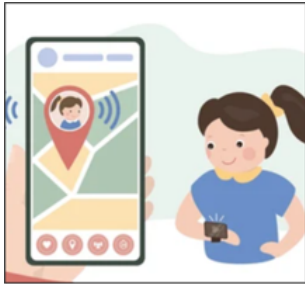
King, N. R. (1982). Children’s play as a form of resistance in the classroom. *Journal of Education*, 164(4), 320–329. <https://doi.org/10.1177/002205748216400402>

Edwards, S., Caughey, J., Heard, A., & Vanderkly, K. (under review). Making sense of children’s play with AI as pharmakon: Early Childhood Education and Care in the postdigital. Chapter in Goodacre, E., & Gibson, J (Eds). *AI in the Early Years: Interdisciplinary voices on GenAI, play, and child development*. Routledge.



I control AI (Annie X, age 6)

“**Democratic participation** is an important criterion of citizenship: it is a means by which children and adults can participate with others in shaping decisions affecting themselves, groups of which they are members and the wider society. It is also a means of resisting power and its will to govern, and the forms of oppression and injustice that arise from the unrestrained exercise of power. Last but not least, democracy creates the possibility for diversity to flourish. By so doing, it offers the best environment for the production of “**new thinking and new practice**” (Moss, 2007, p. 7).



Generation 3
2020-2026
Post-digital

————— **new thinking and practice** —————→



Generation 4
2026-20XX
Meta-digital

Theorise technology and play
Make the invisible tangible
Listen to many languages
Recognise rights and competence in-situ
Design and redesign for democratisation

Developing teacher understandings of digital play in the early years of schooling

Suzy Edwards ^a, Louise Paatsch ^b, Honor Mackley ^c, Jacqui Jarvis^d, Martin Thomson^d, Courtney Mogensen^d, Claire Lay^d and Nichola Mead^d

^aAustralian Catholic University, Fitzroy, VIC, Australia; ^bAustralian Research Council Centre of Excellence for the Digital Child, Deakin University, Melbourne, VIC, Australia; ^cBrisbane Catholic Education Office, Brisbane, QLD, Australia; ^dSt James' Parish School, Sebastopol, VIC, Australia



Now that the goats have phones:
Order a boat to cross the river
Encounter pop-up advertising
Do you want speedboat?

‘What are pop-ups? How do pop-ups work? What are pop-ups seeking from people? What is the best way to deal with pop-ups?’ (Edwards, et al., 2026, p. 12)

Theorise technology and play
Make the invisible tangible
Listen to many languages
Recognise rights and competence in-situ
Design and redesign for democratisation



Billy Goats Gruff provided with mobile phones by a friendly farmer



An invitation ...

Theorise technology and play
Make the invisible tangible
Listen to many languages
Recognise rights and competence in-situ
Design and redesign for democratisation

“Education is always political, to the extent to which it enables student participation in the societies in which they live and into which they will grow as adults”

(Edwards, et al., 2026, p. 15)

References

- Baran, P. (1962). On distributed communication networks. RAND Corporation.
- Berners-Lee, T. (1989). Information management: A proposal. CERN.
- Burnett, C., Merchant, G., & Neumann, M. M. (2020). Closing the gap? Overcoming limitations in sociomaterial accounts of early literacy. *Journal of Early Childhood Literacy*, 20(1), 111–133.
- Caughey, J., Edwards, S., Third, A., Henderson, M., Page, J., Minson, V., Humphrey, K., Manches, A., & Culver, S. (2026). Play-based learning about artificial intelligence (AI) for 5- to 8-year-old children: Final report. Australian Catholic University.
- Chu, C., Paatsch, L., Kervin, L., & Edwards, S. (2024). Digital play in the early years: A systematic review. *International Journal of Child-Computer Interaction*, 40, 100652.
- Early Childhood Australia. (2018). Statement on young children and digital technologies. Early Childhood Australia.
- Edwards, S. (2023). Concepts for early childhood education and care in the postdigital. *Postdigital Science and Education*, 5, 777–798. <https://doi.org/10.1007/s42438-022-00356-7>
- Edwards, S., Caughey, J., Henderson, M., Manches, A., Culver, S. H., Page, J., Third, A., Minson, V., & Humphrey, K. (2026). AI pedagogies and AI literacies for early childhood education and care. *International Journal of Educational Research Open*, 11, 100562.
- Edwards, S., Caughey, J., Heard, A., & Vanderkly, K. (under review). Making sense of children's play with AI as pharmakon: Early childhood education and care in the postdigital. In E. Goodacre & J. Gibson (Eds.), *AI in the early years: Interdisciplinary voices on GenAI, play, and child development*. Routledge.
- Edwards, S., & Straker, L. (Eds.). (2026). *Young children in digital society: Now and into the future*. Routledge.
- Feenberg, A. (2009). What is philosophy of technology? In *International handbook of research and development in technology education* (pp. 159–166). Brill.
- Feenberg, A. (2020). Critical constructivism: An exposition and defense. *Logos: A Journal of Modern Society and Culture*, 19(2).
- Jandrić, P., & Knox, J. (2022). The postdigital turn: Philosophy, education, research. *Policy futures in education*, 20(7), 780-795.
- Kay, A. (1972). A personal computer for children of all ages. In *Proceedings of the ACM National Conference*. Association for Computing Machinery.

References (cont.)

- King, N. R. (1982). Children's play as a form of resistance in the classroom. *Journal of Education*, 164(4), 320–329. <https://doi.org/10.1177/002205748216400402>
- Lafton, T. (2015). Digital literacy practices and pedagogical moments: Human and non-human intertwining in early childhood education. *Contemporary Issues in Early Childhood*, 16(2), 142–152.
- Luo, W., Gao, M., Liu, J., Berson, I., Berson, M., & Li, H. (2026). The illusion of agency: Deconstructing AI's influence on the generation of authentic agency in early childhood. *AI, Brain and Child*, 2(1), 17.
- Moss, P. (2007). Bringing politics into the nursery: Early childhood education as a democratic practice. *European Early Childhood Education Research Journal*, 15(1), 5–20. <https://doi.org/10.1080/13502930601046620>
- Murris, K. (2023). 'This is not a photograph of Zuko': How agential realism disrupts child-centred notions of agency in digital play research. *Children's Geographies*, 21(3), 547–562.
- Nolan, A., Edwards, S., Salamon, A., Straker, L., Grieshaber, S., Skouteris, H., & Bartlett, J. (2022). Young children's agency with digital technologies. *Children & Society*, 36(4), 541–563.
- Pettersen, K., Arnseth, H. C., & Silseth, K. (2022). Playing Minecraft: Young children's postdigital play. *Journal of Early Childhood Literacy*, 25(1), 133–157.
- Sørenssen, I. K. (2024). Exploring enactments of the big screen and the small screen in a Norwegian early childhood education and care setting. *Contemporary Issues in Early Childhood*, 25(4), 460–472.
- Zakariyah, M. F., & Lestari, G. D. (2026). Young children in digital society: Now and into the future [Review of the book *Young children in digital society: Now and into the future*, by S. Edwards & L. Straker, Eds.]. *Journal of Human Behavior in the Social Environment*. <https://doi.org/10.1080/10911359.2026.2685077>