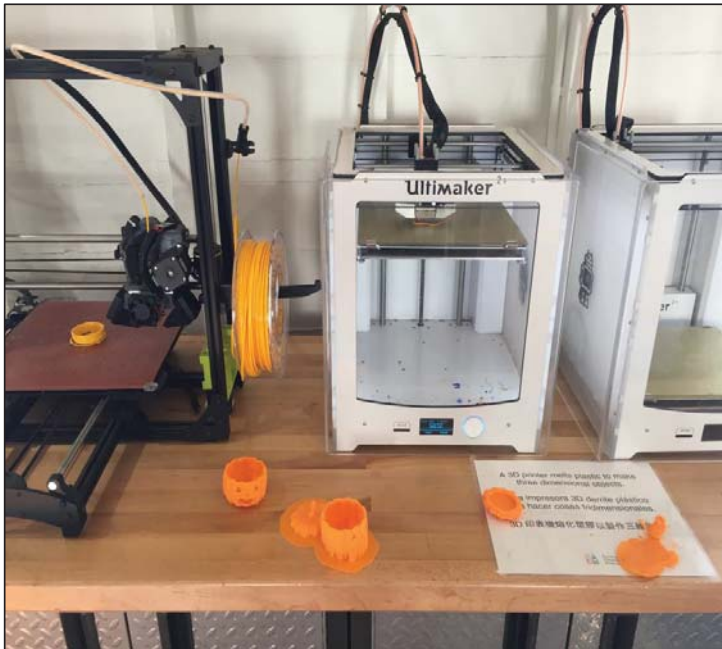




Connecting learning:
Parents and young children
in makerspaces

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Makerspaces in the early years: Enhancing digital literacy and creativity



MakEY was a 30 month project (2016-2019) funded by the EU Commission's Horizon 2020 programme. It brought together researchers and educators from Australia, Canada, Colombia, Denmark, Finland, Germany, Iceland, Norway, Romania, South Africa, UK and the USA.



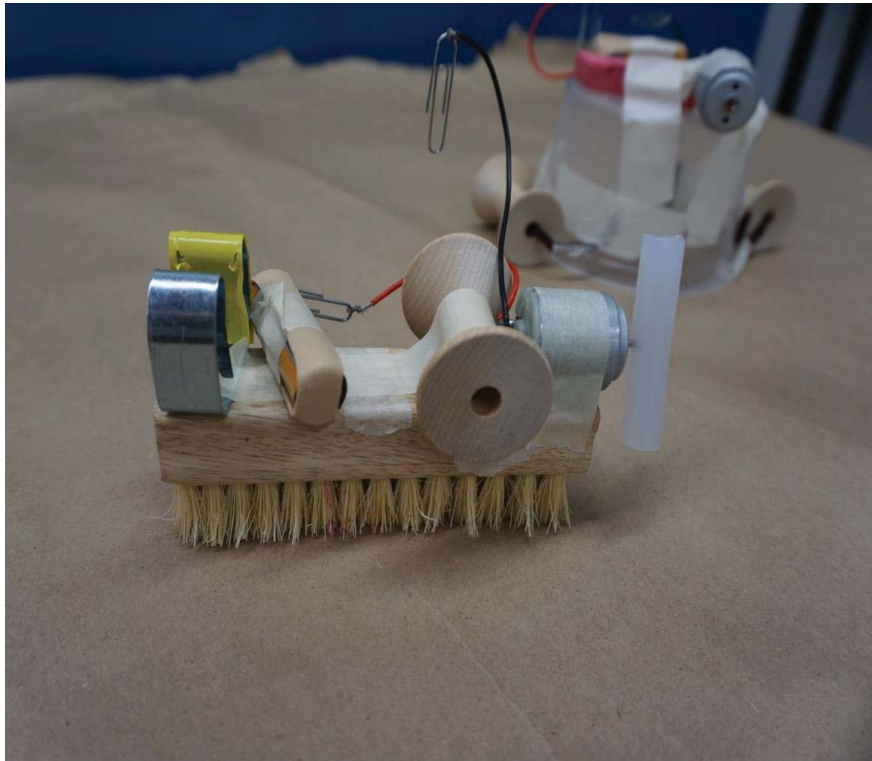
www.makeyproject.eu

MakEY aims & objectives



- Understand how young children gain digital literacy and creative design skills through hands-on 'making and tinkering'
- Create research-practice partnerships to enhance research capacity and practitioner knowledge
- Develop a network of researchers, creative industry professionals and educators who collaborate to develop educational materials and tools to foster children's digital literacy and design skills
- Offer recommendations for research, policy and practice to develop impactful learning in makerspaces for 3-8 year-olds in non-formal and formal learning spaces

MakEY literature



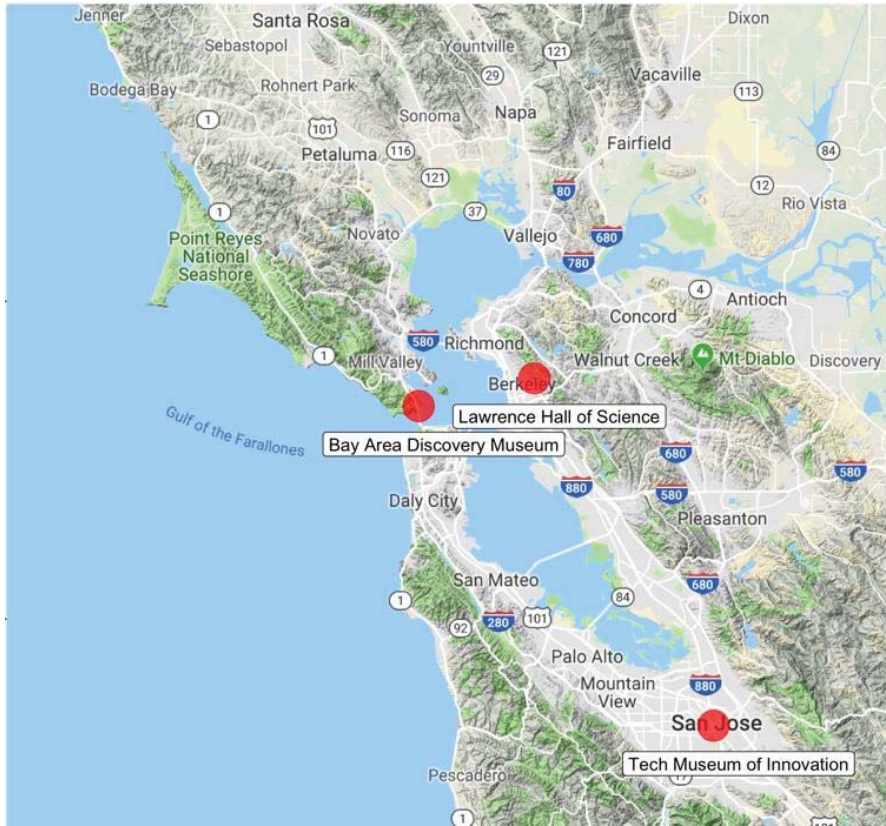
- Making is an iterative and social way for people to come together through shared creation, learning and teaching (Gauntlett, 2011)
- Our inquiry is situated in the 'connected learning' framework (Ito et al., 2013)
- Although 'making' is often non-digital, technology also frequently creates a space for shared pleasure and mentorship within family life (Blum-Ross, 2019)
- Families act as 'dispersed learning systems', not individual visitors (Brahms and Crowley, 2016)

Related literature



- Parents are key resources in establishing an interest in making – and linking this to wider enthusiasm for STEM subjects and knowledge (McClure et al., 2017)
- Even when they lack subject-area knowledge, parents are knowledgeable about the interests, needs and abilities of their own children (Brahms and Crowley, 2016)

MakEY project: Silicon Valley parents



- Investigated the benefits and challenges of including young children, with their parents and caretakers, in three museum Makerspaces in the San Francisco Bay Area
- Built upon our previous 'Parenting for a Digital Future' project by focusing on the role of parents in engaging with making activities to support emerging forms of digital literacy
- Mapped the roles that parents adopt in makerspaces

Research questions



1. Why do parents bring their children to makerspaces? How does learning in makerspaces connect to learning at home?
2. What do the facilitators expect of parents? What do the parents expect – of their child, the facilitators, themselves?
3. How do the institutional, physical and social arrangements of museums 'invite' (or not) parents to participate alongside children?
4. Is the technology really relevant or are traditional crafts enough?

Research methodology



- We visited each museum three to five times, for several hours per visit
- We began with 'gatekeeper' interviews with senior museum staff, then scoping follow up visits to capture the range of activities and participants
- We conducted interviews with families opportunistically, giving parents an information sheet, asking for permission to audio- or video-record the activities, and for signed consent for interviews

Outcomes



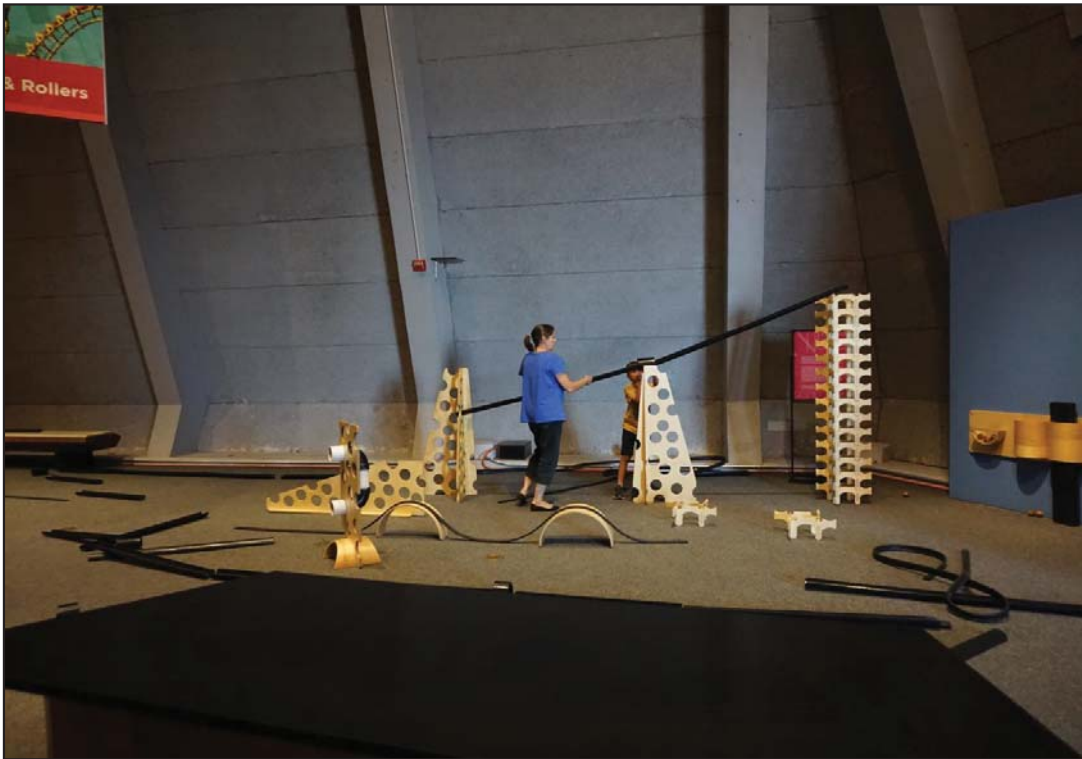
1. We map how parents enact more or less supportive roles during children's making experiences
2. We argue that parents can play a role in connecting or disconnecting learning across people and sites, especially for young children
3. We explore how this role is conceived and whether it could be better designed
4. We offer policy recommendations based on the benefits and challenges of makerspaces we observed

Site #1: Bay Area Discovery Museum



- World's first early childhood FabLab, BADM emphasises 'creativity' in addition to science
- BADM facilitators talked more of 'design' or 'imagination.' Activities included: designing prototypes on paper, then on tablets using the design software Tinkercad, then cutting out shapes and assembling before testing and iterating the designs
- Visitors were a mix of local parents from a range of professions including tech; being located near the Golden Gate Bridge and within a National Park

Site #2: Lawrence Hall of Science



- LHS is across the bay from San Francisco in Berkeley (affiliated with University of California, Berkeley)
- LHS's dedicated makerspace - the **Ingenuity Lab** - was in a dedicated downstairs classroom
- Many of the younger facilitators and volunteers at LHS are drawn from UC Berkeley
- The target age was children aged four or five
- Some parents with 'worked in tech' but the range of experiences was wider, including university parents

Site #3: The Tech Museum of Innovation



- The Tech is located in San Jose, a mixed ethnicity city at the Southern end of Silicon Valley
- It was the most technology focused, with permanent exhibits on microprocessors, cybersecurity, robotics, VR and more, sponsored by such companies as Intel, Google and Lockheed Martin
- Its makerspace - the **Design Lab** – was on the lower floor and required parents to enter through an opening staffed by a greeter
- The children were at the older end of our age range (6+) with a target range as eight-to-nine- year olds
- Many families worked in technology or related work

Why do parents come to makerspaces?

- *To promote creativity (with and without technology)*

“Generally his world is playing with balls and trucks and cars. It's really hard for me to get him engaged in creative or artsy things. He doesn't like to draw. Whenever I try to get him into that sort of more creative, design or anything, I try to incorporate cars or planes or balls. So I thought this would be perfect...But I love how innovative it is from like drawing the picture and then using the tablet.” – Mum (BADM)

- *To engage with holistic learning*

"But honestly, we are more like, we want to give a more organic learning.” – Mum (BADM)



Why do parents come to makerspaces?



- *Skills development*

“I think free play is important, but, like with drawing right now is giving him fine motor skills, so that he can actually use the pencil. I'm just trying to expose him to those things to get those skills that he's going to need.” – Mum (BADM)

- *Experimentation*

“And it's not about learning, the effort around learning. It's really about something where you can experiment on your own level.”
- Dad (The Tech)

Facilitators' perspectives on parents' roles



“Taking over”
or
“Disengaged”

Parents are too hands-on because of a fear of their child failing or they “underestimate what kids are capable of doing” (BADM facilitator)



Worried about the parents that were ‘uninvolved’ in their children’s activities and viewed makerspaces as babysitters

Parents' roles in makerspaces



Far from the simple dichotomy seeing parents in the digital age as “helicopter-y” or too disengaged and distracted by their own devices, we witnessed parents playing many different roles in supporting their children’s making experiences:

- *Babysitting*
- *Supervising*
- *Collaborating*
- *Cheerleading*
- *Parallel play*

Babysitting



- There for the basic physical safety of their child but not following or engaging in the making activities
- We observed parents nodding off from exhaustion, breastfeeding younger children, checking time sensitive work emails (having come to the museum during their own work hours) and beyond

Supervising



- Parents standing back and carefully observing, but paying attention
- Parents felt it was important to let their children do the activities on their own but were nonetheless there to help if needed

Collaborating



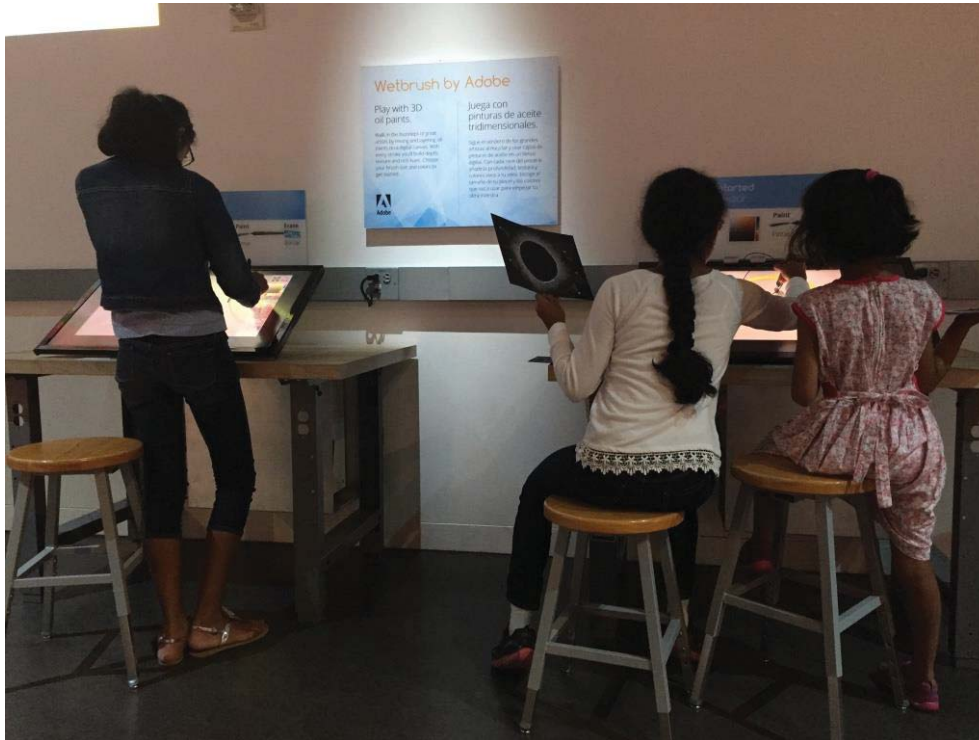
- A more hands-on approach, this included physically assisting in the creation or co-designing with their children

Cheerleading



- A combination of babysitting and supervising
- Parents praised their child's accomplishments by taking photos or videos and loudly applauding/praising

Parallel play



- Parents and children both engaged in making close to one another but not engaging with the same object

How welcome are parents in these spaces?

- ‘Greeters’ acted as a way of enticing parents and/or children into activities
- Facilitators made parents responsibilities clear - not a “drop off” session
- Table top signs and posters giving prompts to parents about the activity

Tips to Support Your Child

- **Play!** Get into the project with your child and show them that you aren’t afraid to experiment with new things
- **Talk to them.** Ask them to describe their process, what they are working on, and why they are making the decisions they are making.
- **Give them time.** Allow your child plenty of time to experiment with the tools and materials before urging them to move on or to “make something”.

Welcoming spaces for parents?

- Some worked to support whole family groups

“One of the points of friction can potentially be the fact that we have these longer dwell time activities [like making] now. So, you know, if an older sibling who is eight or nine or ten really wants to do one of our activities, there’s got to be something for the rest of the family like a nearby exhibit or naptime space. We are trying to think about the family experience holistically, not just focusing on the eight year old.”

–Senior staff member (The Tech)

- Each makerspace differed in whether/how it invited parents into activities designed for their child



Welcoming spaces for parents?



- At BADM the tables and chairs were very low (as in primary schools) or activities took place on cushioned mats on the floor
- Parents had to physically crouch, lean over awkwardly or sit on the ground if they were to join their children
- The space was more comfortable for children than adults



Welcoming spaces for parents?

- At The Tech, tables were at waist height and there were no chairs at all
- The facilitators explained this was designed to help parents get involved
- By our later visits, they had reintroduced benches on the edges of the activity and we observed several parents using these to nap or take a break with their smartphones



Welcoming spaces for parents?

- At LHS the makerspace resembled a classroom for older children, with tables at a more comfortable height for adults
- Here the parents spent the most time sitting next to their child(ren) – this space was most comfortable for those with limited mobility, and here we saw the most active grandparents



Key findings: different parental roles

- There are many different ways in which parents support children through making (*supervising, cheerleading, collaborating, and engaging in parallel play*)
- Some parents saw themselves as learning resources by helping directly steer their children within activities, while acquiring new skills
- Others consciously disengaged from children in order to give them space
- Even those parents who did not take part in activities at all often had their own 'theory of learning' that had led them to bring their child to the makerspace in the first place



Key findings: parents as connectors

- Rather than being passively disengaged or controlling, we found that parents tailor their actions (or inactions) according to their own understandings, skills and values, and needs of their children
- One overlooked contribution of the parents is the work they did in connecting their child's learning experiences across sites, helping them make sense of the makerspace activities in relation to other parts of their lives
- Parents' knowledge of their children, knowing when to push, and what might motivate, were also complemented by their physical intimacy and ability to help children when needed



Policy implications

Access: Increasing access for those who might not normally be able to participate is essential to the quality and sustainability of makerspaces

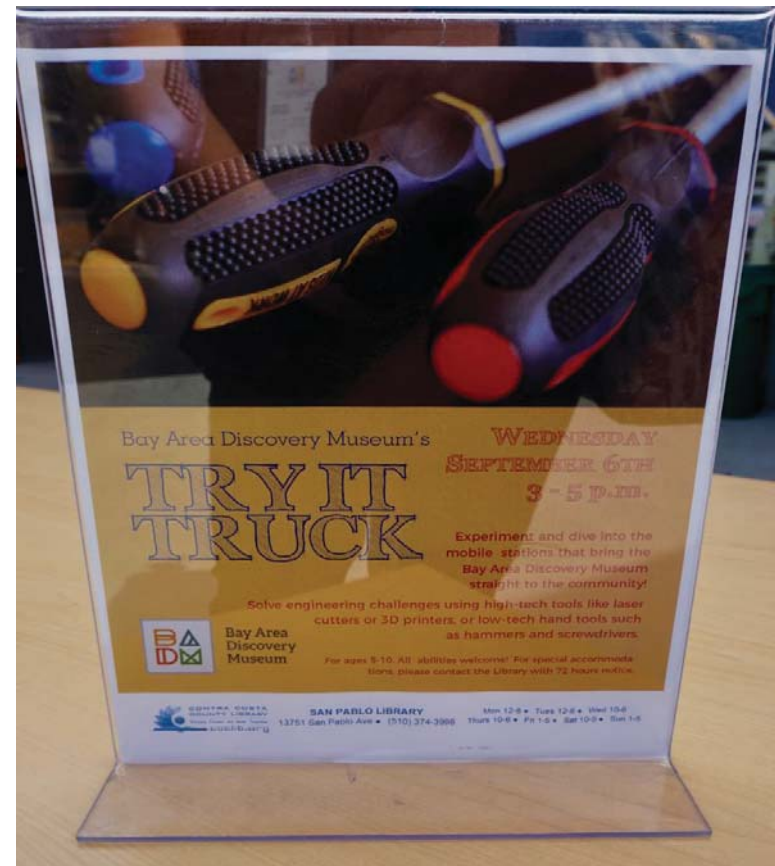
Communication: Communicating the benefits of makerspaces, beyond those who are already participating in makerspaces, is essential to promoting diversity, inclusion, and growth of makerspaces

Sustainability: Strengthening funding agreements with particular consideration to the life-cycle of the makerspace in order to help sustain diversity and inclusion outreach.



Recommendations: Access

1. Different strategies should be taken for car centric regions. Trusts, charities, private donors, and grant funders could subsidize ridesharing options such as vanpools for lower income areas
2. Widen the appeal of makerspaces by incorporating partners in sectors outside of the tech sector
3. Agriculture, manufacturing, aerospace, and construction are all areas that could benefit from having a stake in makerspaces by introducing other creative foci from their sector while broadening makers' exposure and interests



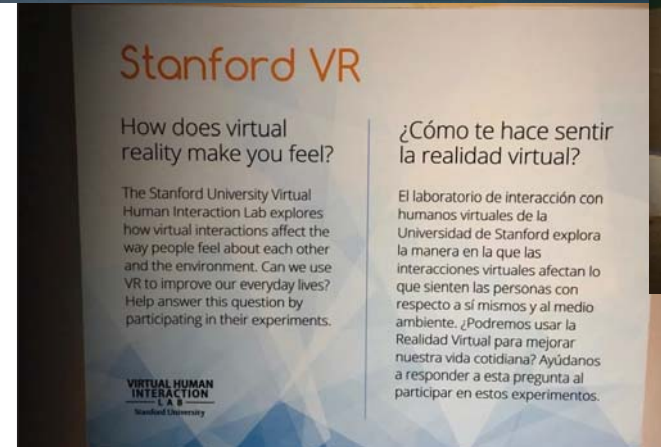
Recommendations: Communication

1. Ensure that the existence and benefits of makerspaces are communicated using all languages spoken by the local populace is crucial for widening access
2. Improve communication on the importance and value of makerspaces to parents is needed. This can be done by partnering with community groups
3. Aid local advertising efforts including billboards and flyers can have the dual purpose of makerspace resources and benefits while improving inclusion and diversity outreach



Recommendations: Sustainability

1. Strengthen funding agreements with particular consideration to the life-cycle of the makerspace in order to help sustain diversity and inclusion outreach
2. Ensure strong and sustainable funding agreements that extend the lifespan of local makerspaces allows for important long-term planning by the parents
3. Partner with the public and non-profit sector in addition to the private sector partners in order to help strengthen and ensure the sustainability of the programs by building community support for local makerspaces



Thank you

Details about the MakEY project including publications and research updates can be found at: <https://makeyproject.eu/about/>



Details about the Connected Learning framework and research is located at: <https://clalliance.org/about-connected-learning/>



More resources and related publications on parenting in the digital age can be found at the Parenting for a Digital Future Blog: <https://blogs.lse.ac.uk/parenting4digitalfuture/>



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