<https://www.diyability.org/>

<https://www.instructables.com/>

https://www.crowdsupply.com/

**Reference**

ACM reference

**Summary**

Paper summary

**Relevance**

Paper relevance

**Reference**

Kirsten Ellis, Emily Dao, Osian Smith, Stephen Lindsay, and Patrick Olivier. 2021. TapeBlocks: A Making Toolkit for People Living with Intellectual Disabilities. In CHI Conference on Human Factors in Computing Systems (CHI ’21), May 8–13, 2021, Yokohama, Japan. ACM, New York, NY, USA, 12 pages. <https://doi.org/10.1145/3411764.3445647>

**Summary**

This paper describes the concept of “TapeBlocks” – an electronics toolkit made up of foam blocks with conductive tape and various components aimed at people with intellectual disabilities. It’s designed to lower the entry barriers to learning and engaging with electronics. Does this by aiming for: tinkerability, affordability, and a low threshold for engagement.

Evaluated them by interviewing makers, special educational needs teachers, and support coaches. Used this feedback to create a number of maker workshops using TapeBlocks for young adults with intellectual disabilities.

**Reference**

Nick Taylor, Ursula Hurley, and Philip Connolly. 2016. Making Community: The Wider Role of Makerspaces in Public Life. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI ’16), Association for Computing Machinery, New York, NY, USA, 1415–1425. DOI:https://doi.org/10.1145/2858036.2858073

**Summary**

Looking at the impact and roles makerspaces have in public life through site visits and interviews at makerspaces in the UK. Also looks at how to extend the positive benefits to people currently outwith the community and how to remove barriers to this. Mentions the large positive social aspect of makerspaces. Looking at including the disabled community.

**Reference**

Ravihansa Rajapakse, Margot Brereton, Laurianne Sitbon, and Paul Roe. 2015. A Collaborative Approach to Design Individualized Technologies with People with a Disability. In Proceedings of the Annual Meeting of the Australian Special Interest Group for Computer Human Interaction (OzCHI ’15), Association for Computing Machinery, New York, NY, USA, 29–33. DOI:https://doi.org/10.1145/2838739.2838824

**Summary**

About the process of creating individualised technologies for people with disabilities. Specifically about the collaboration between all the people you need to achieve it, and the potential challenges this collaboration can cause.

They researched this by involving: a maker community, a disability services organisation, and university staff and students.

Sources of potential conflict:

* makerspaces putting emphasis on tinkering rather than creating high quality finished products VS the need of disabled people to get a piece of AT.
* makers traditionally creating items for themselves, having to adapt to making something for someone else

**Relevance**

The DSO that was involved works mostly with people with intellectual disabilities. However not looking at disabled people making DIY-AT for themselves, but someone else making it for them. More of an overview of different potential issues that could arise from these groups working together to create assistive technology. Not incredibly relevant but raises interesting points on the interaction between communities.

**Reference**

Jonathan Hook, Sanne Verbaan, Abigail Durrant, Patrick Olivier, and Peter Wright. 2014. A study of the challenges related to DIY assistive technology in the context of children with disabilities. In Proceedings of the 2014 conference on Designing interactive systems (DIS ’14), Association for Computing Machinery, New York, NY, USA, 597–606. DOI:https://doi.org/10.1145/2598510.2598530

**Summary**

Study looking at the challenges of the process of creating DIY-AT for children with disabilities. Method used was 11 semi-structured interviews with a range of shareholders, 10 of which were based in the UK.

* Lack of confidence in DIY from non-makers a barrier to creating DIY-AT. Suggestion that online resources alone wouldn’t be enough to get people making DIY-AT/more confident, but a practical demonstration of these technologies might be. DIY-AT for children needs to be really robust.
* Concerned with the aesthetics of the DIY-AT – ones that highlight/make apparent the users disability are more likely to be abandoned. Concern that DIY-AT would be rougher/unfinished compared to other (commercial) AT which would make it stand out more.
* Concern about the safety of DIY-AT in situations. Professional AT companies go through a rigorous risk assessment with each piece of their AT – worry that non-professionals wouldn’t do this, or even know how to do this. Concern about people following online tutorials to create DIY-AT without having the relevant skills and therefore creating something that is unsafe.
* Use of DIY-AT that might negatively impact the disabled user – need to have a medical professional involved in the discussion of using that specific AT.

Then suggests that the process of rapid prototyping could help with some of these concerns. Talking about introducing non-makers (ie. parents of disabled children, teachers) to making DIY-AT, OR connecting these people with existing makers, both in allowing those makers to create DIY-AT for them and giving advice to these non-makers.

**Relevance**

Looking at children rather than adults. Looking at non-disabled people creating DIY-AT for disabled people.

**Reference**

Jacob O. Wobbrock, Shaun K. Kane, Krzysztof Z. Gajos, Susumu Harada, and Jon Froehlich. 2011. Ability-Based Design: Concept, Principles and Examples. *ACM Trans. Access. Comput.* 3, 3 (April 2011), 9:1-9:27. DOI:<https://doi.org/10.1145/1952383.1952384>

**Summary**

Introduces the concept of “ability based design”, creating accessible technology by focusing on the abilities of disabled users, rather than their disabilities. Suggests that failing in current AT may be because it’s focused on disability rather than ability. The idea that the (software) system should change to fit the users need, rather than the other way around. Discusses this idea. More about making something accessible for one specific user. Gives 7 principles to follow/consider. Then talks about examples of projects that informed these principles.

**Relevance**

Maybe my project is about this? RE being dynamic to fit the needs of the user, rather than making the user having to make changes to create the project?

**Reference**

Katherine M. Steele, Brianna Blaser, and Maya Cakmak. 2018. Accessible Making: Designing Makerspaces for Accessibility. International Journal of Designs for Learning 9, 1 (June 2018), 114–121. DOI:https://doi.org/10.14434/ijdl.v9i1.22648

**Summary**

About the process of making a makerspace more accessible to people with disabilities. Does this through a tour of a maker space, a design activity, and a brainstorming session. Draws on human centred design and universal design. This process worked with 6 students with a range of disabilities (including mobility impairments, visual impairments, and ASD). Also included engineering faculty, disability experts, makerspace staff, and able-bodied engineering undergrads.

Observations:

* student who used a wheelchair liked the fact most furniture was on wheels as it makes it easy to get it out of the way
* however visually impaired student found it concerning as they relied on a mental map of the space to get around, and so changes to this affected how they could move around the space
* suspended electrical outlets: keep wires off the floor preventing tripping hazards, improving wheelchair accessibility, and allows flexibility in the space. However if they are at the wrong height they pose problems for people with vision impairments.
* need large, high contrast safety signs and instructions
* training materials + reminder sheets should be available in multiple forms (like an electronic PDF for screen reader users)
* should be clear how to request accommodations or assistance

Lists some sample recommendations in the paper, but they have also summarised the recommendations in an online document. (This is linked in my Zotero)

**Relevance**

Makes concrete suggestions on how to improve specific issues in maker spaces. Linked checklist could be of some use (as a resource to give to makerspaces). However the disabilities studied don’t include ones completely relevant.

**Reference**

Aisling Ann O’Kane, Amy Hurst, Gerrit Niezen, Nicolai Marquardt, Jon Bird, and Gregory Abowd. 2016. Advances in DIY Health and Wellbeing. In Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA ’16), Association for Computing Machinery, New York, NY, USA, 3453–3460. DOI:https://doi.org/10.1145/2851581.2856467

**Summary**

Paper is looking at the advances in DIY health and wellbeing devices, and the HCI implications of this. Using people with type 1 diabetes as a case study. Need for bespoke/personalised self-care devices has been demonstrated in this group. Personalisation of TD1 devices: using accessories such as luggage tags to carry their devices, order customised stickers/skins to add to their devices. Movements such as #WeAreNotWaiting that use their technical expertise to create and release bespoke tech solutions faster than manufacturers/research labs - since they believe manufacturers are taking too long to release products that provide important functionalities – such as uploading glucose meter data to the cloud. DIY groups such as Nightscout have modified CGMs to broadcast “CGM in the Cloud” and communicate with other devices that aren’t reachable with the commercially available CGM Bluetooth capabilities. This allows people to broadcast their results to their smartphones/smartwatches, and allow parents to monitor their children’s BG levels remotely and in real time.

Challenges have emerged:

* majority of people who’d benefit from these personalised self-care tools don’t have the relevant technical experience to participate in this DIY maker culture
* development of useful tutorials for open-source tech has been difficult in the HCI domain (!!!!)

Done via a workshop of HCI researchers to discuss the challenges in this field including:

* disseminating DIY health technologies further
* financial motivations in DIY health and wellbeing
* spreading DIY knowledge to other communities
* weighing the benefits of DIY health and wellbeing tech

This paper doesn’t actually cover the workshop lol

**Relevance**

Paper relevance

**Reference**

Alyssa Boccardi, Kimberly A. Szucs, Ikenna D. Ebuenyi, and Anand Mhatre. 2022. Assistive Technology Makerspaces Promote Capability of Adults with Intellectual and Developmental Disabilities. Societies 12, 6 (December 2022), 155. DOI:https://doi.org/10.3390/soc12060155

**Summary**

Investigating the feasibility of adopting makerspaces into the environments that serve people with disabilities. Did this by modelling a makerspace training program based on the capability approach framework. The 8 week program aimed to train 5 adults with intellectual and developmental disabilities (IDD) and 5 staff members at a community services centre. Outcomes were measured using knowledge tests, surveys, QUEST 2.0 and interviews. Results indicated a significant increase in staff knowledge and familiarity with program topics. Participants with IDD were highly satisfied with the ease of use, weight, and effectiveness of the AT devices they created. Thematic analysis of the interviews revealed 5 themes:

1. inclusive environment
2. freedom and improved capability for building technology for self or client
3. multidisciplinary collaboration
4. interactive program elements
5. makerspace challenges

**Relevance**

Seems very relevant, just came out recently, do a more in depth review of this one.

**Reference**

Jie Qi, Leah Buechley, Andrew “bunnie” Huang, Patricia Ng, Sean Cross, and Joseph A. Paradiso. 2018. Chibitronics in the Wild: Engaging New Communities in Creating Technology with Paper Electronics. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI ’18), Association for Computing Machinery, New York, NY, USA, 1–11. DOI:https://doi.org/10.1145/3173574.3173826

**Summary**

Looking at the public adoption of the Chibitronics circuit sticker toolkit.

**Relevance**

Paper relevance

**Reference**

Leandro Soares Guedes, Ryan Colin Gibson, Kirsten Ellis, Laurianne Sitbon, and Monica Landoni. 2022. Designing with and for People with Intellectual Disabilities. In The 24th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS ’22), October 23–26, 2022, Athens, Greece. ACM, New York, NY, USA, 6 pages. <https://doi.org/10.1145/3517428.3550406>

**Summary**

Half day workshop. Idea of AT being abandoned due to all stakeholders not being involved in the design/evaluation process, resulting in AT that doesn’t meet their needs. Workshop aim is to gather relevant researchers to share experiences on how to design for/with people with ID. Outcome: filling a gap on available guidelines to include people with IDs in research through more accessible protocols. Which would result in better personalised/fit for purpose technologies.

**Relevance**

Paper relevance. Seems to be a very useful starting off point/getting links in the topic of designing things for people with IDs/cognitive impairments.

NEED TO WRITE MORE FOR THIS

**Reference**

Ravihansa Rajapakse, Margot Brereton, Paul Roe, and Laurianne Sitbon. 2014. Designing with people with disabilities: adapting best practices of DIY and organizational approaches. In *Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: the Future of Design* (OzCHI ’14), Association for Computing Machinery, New York, NY, USA, 519–522. DOI:<https://doi.org/10.1145/2686612.2686694>

**Summary**

Looking at how to adapt DIY practices for designing for people with disabilities. Does this by interviewing stakeholders in the disability services sector and observing local makerspaces to understand current practices.

**Relevance**

This is linked/basically the same as another paper (linked in zotero)

**Reference**

Janis Lena Meissner, John Vines, Janice McLaughlin, Thomas Nappey, Jekaterina Maksimova, and Peter Wright. 2017. Do-It-Yourself Empowerment as Experienced by Novice Makers with Disabilities. In *Proceedings of the 2017 Conference on Designing Interactive Systems* (DIS ’17), Association for Computing Machinery, New York, NY, USA, 1053–1065. DOI:<https://doi.org/10.1145/3064663.3064674>

**Summary**

Paper aims to? I’m not sure.

They did a qualitative study looking at how disabled people experience the empowering potential of making. Then analysed online videos created by disabled makers, and carried out fieldwork at 2 makerspaces.

Used the information from this to design a series of workshops (DIY-Abilities) for people with disabilities to learn different maker technologies and complete an individual maker project. Analysed the participants narratives to create a new perspective on the specific social and material capacities of accessible maker initiatives.

They considered how disabled people already do/can make use of digital fab tools (qualitative study)

**Relevance**

13 pages long. Do a more in depth summary of this.

**Reference**

Silvia Lindtner, Garnet D. Hertz, and Paul Dourish. 2014. Emerging sites of HCI innovation: hackerspaces, hardware startups & incubators. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI ’14), Association for Computing Machinery, New York, NY, USA, 439–448. DOI:<https://doi.org/10.1145/2556288.2557132>

**Summary**

Looking at how hackerspaces work. And how they impact HCI.

**Relevance**

Paper relevance. 10 pages.

**Reference**

MakeAbility: Creating Accessible Makerspace Events in a Public Library

**Summary**

Paper is about planning and executing an accessible makerspace event in a library, specifically for people with cognitive and visual impairments.

First they did a lit review on the maker movement. Then gave a description of makerspaces in libraries.

Highlight the insufficient focus on making these spaces accessible.

Then a description of their makerspace event and what modifications they made on the day.

Used this to give suggestions for creating accessible makerspace events in libraries, including concrete recommendations on station design.

Team consisted of students and staff from the university information studies department, in collaboration with a public library and FutureMakers (kidsmakethingsbetter.com).

Lit review: bunch of stuff about makerspaces/maker culture. Notes that libraries are shifting more to electronic materials and hardware. Idea of applying the maker community principle of adaptation and creative solutions to making the community more accessible.

Event:

Participants were regular attendees at the public library’s events. A group of visually impaired teenagers, and a group of adults with cognitive disabilities. Event was also open for drop-ins on the day.

The team consulted with local makerspace community members, and local disability support services.

Around a dozen people attended the event.

Used:

* a wind tube
* a marble machine
* MaKeyMaKeys
* wiggle robots
* a vinyl cutter

They found that stations that were fully participatory where more successful. Suggested that the adults with cognitive disabilities might’ve benefited from more focused, group oriented activities.

Recommendations:

* reach out to community members already involved in the makerspace community
* give serious consideration to the different abilities of potential attendees to make any modifications so everyone can participate. Or, at least have a range of activities so that if someone can’t use one they can use another
* seek feedback from attendees (it’s an iterative process!)

**Relevance**

Isn’t incredibly in depth, especially surrounding the actual modifications made and does not give a detailed write up of the “experiment”. Raises some good points about libraries, and gives some general advice on such events. Did include adults with cognitive abilities, which is relevant.

Should probably look to see if they did any further papers on this topic.

**Reference**

Nic Hollinworth, Faustina Hwang, Kate Allen, Gosia Malgosia Kwiatkowska, and Andy Minnion. 2014. Making electronics more accessible to people with learning disabilities. In *CHI ’14 Extended Abstracts on Human Factors in Computing Systems* (CHI EA ’14), Association for Computing Machinery, New York, NY, USA, 1255–1260. DOI:<https://doi.org/10.1145/2559206.2581175>

**Summary**

About adapting “littleBits” electronic components by attaching them a larger base. This aimed to make it easier to pick up and handle, and assemble into circuits by people with learning disabilities.

Then did a pilot study with a group of students with learning disabilities.

Found fewer difficulties in assembling the components into circuits, and eliminated problems such as trying to connect them the wrong way around/up.

**Relevance**

Is an extended abstract. They haven’t released anything else about this since, I think.

**Reference**

ACM reference

**Summary**

Paper summary

**Relevance**

Paper relevance

**Notes**

Makerspaces == hackerspaces == fab labs. Aim to enable people to access resources like digital fabrication and open electronics. Also can include traditional crafts.

**Dissertation**: Building from research done surrounding these groups of disabled people benefiting from making, as well as the barriers for their entry in traditional makerspaces, creating a resource that can be used as a tool for them to carry out making projects.

With regards to DIY-AT, having more of a focus on disabled people themselves creating their own DIY-AT.

“Nothing for us without us”

Human centred design: close engagement of users throughout the design process.

Universal design: making a design usable by the widest group of people with respect to ability and other characteristics.