# *Open technology culture: hacking/making*

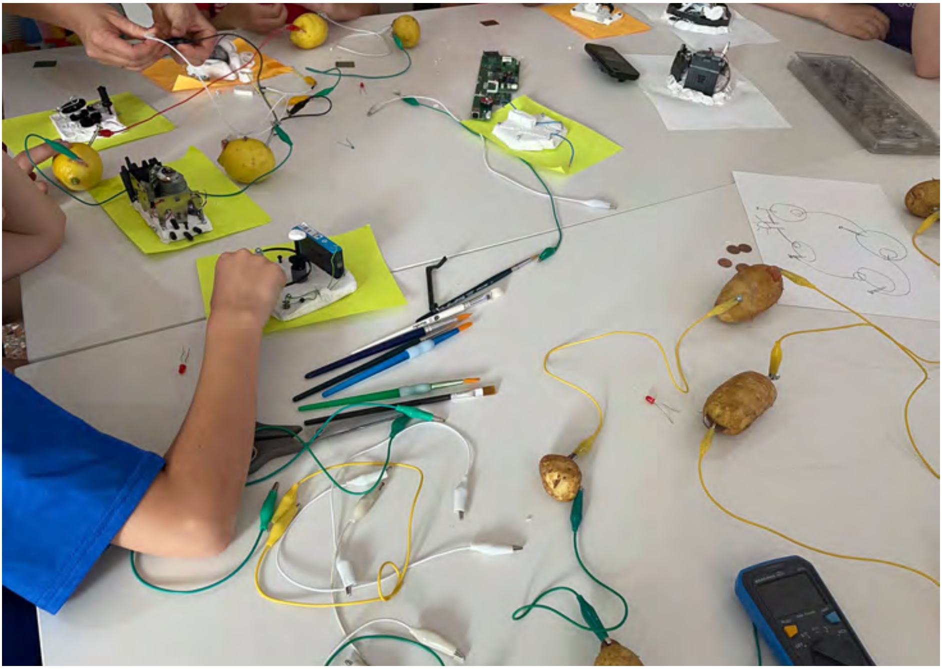
In recent years the impact of technology on society has become a major topic in mainstream culture, media and academic studies (Klein, 2020). Many people are now examining the colonial, environmental and political effects of disruptive technologies such as AI, big data, overconsumption or surveillance and are looking for alternatives (Noble, 2018; Vergès, 2021; Crawford, 2021; Kohei Saito, 2022).[6] While being critical of technology has the potential to make technology more ethical, there is a concern that critical individuals may feel excluded from the field to begin with, leading them to avoid developing technologies that align with their values (Criado Perez, 2019; Kuo et al., 2022).

Hacking is allowing those blocked out by techno-capitalism to start a creative process that involves experimenting, solving problems and finding new ways to use technology. The traditional view of hacking[7] is based on principles like unlimited access to information, distrust of authority and a focus on decentralisation. However, feminist perspectives have challenged this view and expanded the definition of hacking to include care, mutual self-help, embracing failure and promoting social jus-

6 According to recent statistics, only around 10% of people who identify as female are represented in STEM fields at universities in Austria (Statistics Austria, 2021).

7 While the definition of hacking can vary, it is generally understood as the application of knowledge in information technology through unconventional methods. Hacking can be seen as a way to bring about change in both technical and social systems and is viewed as a political and economic force by hacker communities (Jordan, 2008; Söderberg, 2008).

tice and equity (Söderberg & Delfanti, 2014; The Care Collective 2020; Bosold et al., 2021). Today, hacking and making are more popular than ever, and they are supported by governments, corporations and academic institutions. Hacking has been adopted as a pedagogical method for STEM learning, particularly in deprived communities, as a way to promote tech literacy and science skills among citizens, and it has attracted much attention as a method to encourage ideas that can be licensed under profitable patents (Lindtner, 2012; Tan & Barton, 2020). This has led to the growth of open source hardware hacking, DIY and DIWO (do-it-with-others) workshops and hacklabs, and seemingly ubiquitous urban and rural makerspaces. These movements are often referred to as the 'open technology culture', and around 10 years ago they were believed to enable a new Industrial Revolution (O'Reilly, 2007; Shirky, 2008; Anderson, 2010). Yet, most rapid prototyping tools still depend on fragile and toxic commodity chains. The so-called West experienced a new scarcity exposing the limits of maker culture's potential (Dunbar-Hester, 2020; Maly, 2016; Foster & Suwandi, 2020).



Workshop, citizen science project:
Salon of Open Secrets at Kinderuniversität
(Academy of Fine Arts in Vienna) with
Mir* Raggam-Alji, Patrícia J. Reis, Theresa
Schütz, Petra Weixelbraun and Stefanie
Wuschitz, 2023

In Armani et al.'s (2020) article 'Low-tech solutions for the COVID-19 supply chain crisis', the authors focus on the challenges faced by supply chains during the pandemic, and they propose low-tech solutions to address these challenges. The authors argue that while high-tech solutions such as 3D printing and automation have received much attention, low-tech solutions can be equally effective in addressing supply chain disruptions. A conclusion that encouraged the assumptions made in this project.

The authors highlight the critical role played by personal protective equipment (PPE) and medical supplies in the pandemic response – and the challenges associated with their production and distribution. Armani et al. conclude that there is a real need for local and regional supply chains to reduce dependence on global supply chains.

In *Chip War*, Chris Miller considers not only the COVID crisis but also the crisis caused by the scarcity of conflict materials and transition minerals that was experienced. Miller sheds light on imperialist strategies to access semiconductors, produced only by the most precise high-tech chip-fabrication facilities (e.g. the Taiwanese semiconductor manufacturing industry), a critical technology for economic and military dominance (Miller, 2022).

In contrast to what drives high-tech 'chip wars', hacker/maker cultures are still seen as promoting the democratisation of technology, allowing for easier and low-tech access to tools and a worldwide community to create, experiment, test, produce and distribute new products, machines and artefacts. These movements are also viewed as contributing to the rapid transformation of identities, practices and cultures through organising community platforms, conferences and gatherings across different continents.

The study of hacker/maker cultures, their knowledge, practices and institutionalisation, is the subject of ongoing research in fields such as internet and communication technologies (Kelty, 2008; Ratto & Boler, 2014a, 2014b; Garnet Hertz, 2023), science and technology studies (Hess & Ostrom, 2007; Sipos, 2023) and human–computer interaction and education (Sipos, R. Åkerman et al., 2022; Gatz, 2023), among others.

We would like to point out that older structures (e.g. resistant education movements) in the so-called Global South have aligned and often merged with today's maker culture, embracing some of its principles (Siagan, 2016; Nadia, 2020). Many local, deprived or Indigenous communities are celebrating them in entanglement with older autonomous approaches to sharing and collaborating in commons. Self-organised hacklabs on the margins offer precious platforms of hope by implementing science solutions to local needs and crises, enabling people on the ground to collaborate and learn in new ways (Kelty, 2008; GOSH, 2025).

Many times, these shared technologies are underestimated and overlooked by Western-centric hackers. Similarly, stories of people of colour within the IT industry have been left out of existing accounts of tech development (Nakamura, 2014). Fairchild, one of the most important semi-conductor corporations in the US, employed Navajo women to solder integrated circuits. Fairchild had opened a plant in the 1960s and 1970s at Shiprock, New Mexico, on a Navajo reservation (Nakamura, 2014). The plant was shut down in 1975 after protesters had demanded better working conditions for the impoverished Navajo employees (Nakamura, 2014). Nakamura shows in her book how outsourcing electronic manufacture to skilled female workers of colour in Asia was piloted within US borders, on a Navajo reservation in the 1960s and 70s. Today, Indigenous communities are more exposed to radiation, contamination and pollution. This is why strong movements have evolved at the intersection between education, environmentalism and open hardware (Shiva, 2012; Liboiron, 2021; Shiva & Mies, 2022; Demos, 2023). We stand in solidarity with these movements.