Makers, Hackers or Slackers?

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I sat down with Marc on the last day of K_space to chat about his work and ended up having a long conversation about the socio-political meaning of hacking, the direction in which the maker movement is headed, hacking as a teaching method and gender dynamics within the technical field. The interview, transcribed below, is a great explainer on what making and hacking looks like outside of the vacuum of technical fields and instead embedded within society, politics and history.

Let's start with your take on the hype behind the maker movement, what do you think about the notion that it's instigating a third industrial revolution?

I was in Manchester in May/June where I had a meeting with a Chinese maker movement. Manchester was the pioneering place for the first industrial revolution but look at how Manchester has suffered from it; the first European slums were in Manchester, the poverty and misery in Manchester during the first industrial revolution even inspired people like Engels and Marx to study its aftermath. So it was ironic that I was in Manchester having a conversation about 3D printing in the midst of the maker culture hype of ushering in a third industrial revolution.

I come from a technophilic background but the more I pay attention to technology in social, cultural and educational contexts, the more my attention shifts towards how technology impacts society. The real challenges today have primarily come through technology--climate change and so on--which we now try to fix with technology. This is not the right approach because these problems come from the unstudied hype and anticipation regarding an industrial revolution. By focusing so much on technical solutions we neglect the political pressure and social study needed to solve problems. The search for technical solutions has reached exaggerated heights especially with space exploration, which is a problem by itself as the message that we're giving in the way we do space exploration is that that we messed things up in this planet so now it's time to find an alternate place to live.

That brings me to the debate on how to integrate space related content in education; how do we help shape a healthy imagination of space education in children?

I'm a bit skeptical about space education, especially because of the militaristic and nationalist propaganda behind space exploration. That's the reason I raised the question 'why space?' during the K-space workshop.The underlying message needs to be different from the nationalist propaganda of the 50s. It should not be about seeking an alternative because we've messed up here. However, I am a bit convinced from the deliberations on this during K-Space because of the spirit in this group that it can be an inspiring aspect to put into an educational context.

Can you tell me a bit more about this change in mind about space education?

This was a successful workshop and the topic worked well with this group. Kids do get inspired by space. But again, as educators we should put this in a political context and acknowledge that the history of space exploration hasn't been all that positive.

Going back to the maker movement. What do you think of the metamorphosis of the concept of making from a process embedded in learning to almost a cultural fad?

Leah Buechley*, who developed the LilyPad--the wearable arduino--makes a clear analysis of the distinction between the brand 'MAKE' and making as crafting and the larger idea of learning. For instance the MAKE

magazine seems to have a completely different job than the maker movement. The make magazine has a shop that targets a certain audience. Its goals overlap with the maker movement which has become a bit problematic as it takes away from the learning aspect of making.

*Leah Buechley: Thinking About Making – An examination of what we mean by making (MAKEing) these days. What gets made? Who makes? Why does making matter? <https://vimeo.com/110616469>

What about the distinction between hackers and makers? Where is that line drawn and why is it important?

There's a saying that the difference between makers and hackers is that makers have no ethics. Hacking by definition is a bit subversive and self-reflecting. Hackers operate under a certain ethos and a hacker's manifesto. They differ with makers in terms of process in the sense that hacking is about gaining a deeper understanding of the inside and re-appropriating the system whether its an information system, a technical or even societal system. Making has very little subversive meaning, even though crafting and craftivism can sometimes be subversive, by definition it is not. The background and history from which they originate too are separate. The history of hacking in Europe was influenced by the counter culture of the 60s and 70s but especially the punk and DIY movement in the 80s. It was established in Europe broadly in the squatted houses where workshops were set up; electronic workshops and welding workshops that people living there and the wider community were welcome to use. One of the most independent voices within the hacker community has come from Berlin-based hackers, the Chaos Computer Club that have been organizing conferences for over 25 years. They are involved in a range of stuff related to hacking from policy making to engaging with media when required. Americans saw this and emulated these hacker spaces in the USA and adopted a merged version of this practice incorporating making and tinkering. It's funny that this has now returned to Europe as the MAKE brand.

Hacking is more often than not associated with computer systems. So how did biohacking, which is what you practice, and other types of hacking develop?

Originally these hackerspaces were concerned with increasing access to computers, independent servers and internet connection. Then it merged with other electronic hobbies such as ham radio tinkering. I personally started in a DIY electronic community but we were close to the hackerspace scene. These practices then merged with the arduino platform that had started making basic programming and electronics more accessible to a wider audience including designers and artists. Biohacking started around 2008 in different places across the world. The concept of biohacking emerged from playing with genetic data and questions surrounding the privacy of DNA. Another group of biohackers, sometimes called Grinders, began to think of hacking in relation to their own bodies, modification of the body and improving your own body using technology DIY-style. They organize conferences that resemble a gym with body improvement devices and products. I was also inspired by these ideas from Cyberpunk sci-fi literature and something called Ribofunk that discussed these issues. Then there was a DIY biology movement that grew out of synthetic biology, a field of research that started in the early 2000s, an extreme version of genetic engineering which has inspired students to do stuff at home; they started the DIY bio movement along with websites with guidelines for hacking at home. Synthetic biologists run an exclusive student competition that brings engineers and biologists together in making synthetic organs, similar to a robotics competition but related to genetics. They started looking for spaces to do these collaborations more frequently and came across maker and hacker spaces and the creative and open-source medium they embodied, and slowly started merging with this existing movement.

Tell me about Hackteria.

Besides my scientific background in bio-nano interfaces and bio sensors, I started working in the DIY electronic scene and in open culture and hackerspace environments but I also got interested in interdisciplinary artwork, such as artists that work with topics in science, especially biology. I began organizing art festivals with artists working in biology. Meanwhile I was taking classes for biomedical engineers and thought it would be cool to include DIY as a learning method. So then I started to build a laboratory with my students instead of using an existing student lab. With Hackteria, a project I co-founded 7 years ago, we thought of combining art with the stuff we were already doing in biology. But we wanted to promote an amateur and DIY mentality as opposed to artists going through one-year residency programs in a lab, so it became an open-source biological art platform. It was open to anybody with critical inclinations. The setting up of a lab with students was an attempt to demystify science and a testing of the workshop methodology of teaching and learning. For artists, it was to show them that they can do basic biological experiments at home and for them to build confidence to approach scientists about their areas of interests and potential future projects.

You teach kids as well right? How would you say the process of hacking adds to children's experience of learning?

There is a lot of discussion about 'thinking out of the box' and teaching kids creativity but the hacker mentality is to do with looking inside the box, that there should be no black boxes. It's about taking the box apart, studying how it works and finding a new use for it. Hacking inspires people to look behind the walls and do something useful with what they find. It's a very empowering tool. I got into DIY and hacking after I got my PhD. In hindsight, I feel if I'd understood this process before then my research would have turned out completely different. I was scared to take things apart and enjoyed the predictability of pressing buttons to make things happen. Hacking is also political in the sense that it's about taking ownership and doing things the way you want. It's anti-consumerist because you're taking technology or products that have been purchased for use in a particular way and 'misusing' it. The microscope is a good way to introduce the hacker mentality to new people. We take a webcam, look what's inside and build something even more valuable like a microscope. Kids are curious and love taking things apart but they face restrictions from parents who don't allow it. But breaking things allows for understanding, learning and finding a new use for it for yourself.

I was kind of caught by surprise that I started teaching kids. The founder of our DIY community in Switzerland worked in a youth culture house and we used that space a lot. We were developing maker workshops much before the term gained so much traction. So people there suggested that we do a workshop with the kids (10 year olds) who came to the youth house. It was a coincidence but I started to enjoy it. I always like teaching but I'd been focusing more on university students.A lot of people from our DIY community went on to get degrees in Art Education, Media Arts or became teachers. Unlike other maker spaces or DIY electronic communities, we started engaging with educational environments early on. And by coincidence we're now in this unique position that combines hacking and educating. It's nice to see Karkhana taking that same path.

What difference is there between hacking with children and adults?

Sometimes I say if you cannot teach ten-year-olds about high-end science you shouldn't be allowed to teach adults. And the methods that work for 10 year olds should be and are valuable for adults. My own teaching has become very influenced by what I've learned from teaching kids. With adults, the problem starts with the negative connotation they have of the term hacking, usually from images fed by popular media about criminals robbing back accounts and so on. But with 15 year olds I work with, they think of hackers as cool people. Cyberpunk literature also glorifies them as heroes and 'people who know their shit'. But then again this means the concept may be diluted a bit because it may be losing its subversive and political meaning.

I like this idea of Jugaad or bricolage that promotes making use of scarce resources, can you tell me a bit more how it relates to hacking?

I learned about jugaad from my working partner in Bangalore. Hacking in a way is a bit more an intellectual exercise for educated rich white guys in the West. Jugaad comes from a lack of resources and an untrained or uneducated solution to things. But the problem is that by romanticizing Jugaad we run the risk of romanticizing the lack of resources. When we think of people doing jugaad we think people are poor and happy but most people are just poor. Jugaad are rare examples that come out of misery. In India it's related to the caste system in the sense that jugaad is done by people who manage to do something despite their lack of education due to caste discrimination. Again, these are a few solutions out of a million impoverished lives. So we should not romanticize it too much. In hacking, we don't use it in its original sense, we've only taken the idea of using local materials from that concept.

What about the repair culture or Gambiarra?

The maker movement completely neglects the value of repairing or gambiarra. It's always about making something new. The DIY hobbyists originally embraced this repair culture. The repair culture is still embedded in a lot of developing countries; Cuba is famous for it. But there are indications that this might develop elsewhere as well; Sweden has introduced tax breaks on repairs to everything from bikes to household ultitity.* I guess even I talk more than I do. I preach about environmental issues but fly around the world excessively and if something is broken I throw it away. There's an inspiring read on this issue Felipe Fonseca*, that the Critical Making movement has picked up on.

But again I do understand why people in Indonesia for example don't want cars that they have to fix constantly. They're a part of the global consumerist web too. But it's good that countries like Sweden are doing something about getting people to fix and repair things.

* Waste not want not: Sweden to give tax breaks for repairs <https://www.theguardian.com/world/2016/sep/19/waste-not-want-not-sweden-tax-breaks-repairs>

**Gambiarra: Repair Culture, by Felipe Fonseca <https://efeefe-arquivo.github.io/livro/repair-culture/gambiarra/>

Lastly, speaking of the critical making movement, one of the ideas they promote is the embracing of a feminist epistemology in making, hacking or anything technical. What does a woman-centric perspective add to all of this?

The field had a strong and obvious gender-bias. Even in my own work, we encourage women to come to our workshops. But because engineering is such as male dominated field, at the end women enter a completely patriarchal structure. But having more women in there will change this. Also, doing workshops on textiles and sewing to bring women into hacking and technology is just reinforcing gender stereotypes. Either we have to make all hackers sew or encourage women to do something other than sewing LEDs into fashion wear.

I became closely involved in the feminist discourses within the technical field a few years ago through a group of queer feminist hackers who go by 'trans-hack feminists'. It was very interesting for me to be so personally involved in these circles in Spain. Spain anyway has a strong feminist movement. We collaborated for a few years and I went to the Trans-hack Feminist festival. This used to be called the Eclectic Tech Festival and was for women only but Spain organized the trans-hack festival to include gender-fluid, queer identities as well.

This diversity is a good thing, although its difficult for me to explain in what way. Maybe it's a way of subtly providing role models for aspiring hacker, engineers, makers of all backgrounds without protesting on the

streets. Different genders being involved also adds to the array of possibilities for hacking. For instance, making your own hormones. I was surprised to see them on the one hand using microscopes in similar methods as other hackers but also as a socio-political way of self-awareness about genitalia. Then there's Gynepunk* who look into medical equipment for self-diagnosis. Most medical devices are developed by males. The speculum is one example of that, it was made by a male doctor who did his experiment of vaginal inspection on slaves. Again all the anatomy of the vagina has names of males who 'found' it. So we 3D printed the speculum for fun as a symbolic way to spread the socio-political message about including female hacker perspective on gynecology. But overall, the gender perspective is slowly challenging the male gaze on technology.

*GYNEpunk <http://hackteria.org/wiki/BIO-reSEARCH>