Interview excerpts

Interview with Gameli Adzaho

Hi, my name is Gameli Adzaho. Right now I live in Ghana — I come from the water region. But I live in Accra, which is the capital city of Ghana. So, in my day job I work as a technical lead on a programme called Research and Innovation Systems for Africa (RISA). I'm also part of the Global Lab Network and Ghana Think Foundation, and these groups are basically looking at issues around education, public participation in science and technology, environmental sustainability and youth participation. Obviously, one of the most important pieces of technology that we have in our world today is the internet. Through the power of the internet, I'm able to connect with my colleagues in different countries in Africa and also around the world. To be able to collaborate and deliver on our projects, to be able to learn new things, to be able to create, and to be able to also engage people on different topics, in a bid to build a better world and a better society, as it were.

Also, in the projects I work on, people are creating new types of technology, or at least using existing technology, in a new way, and they use it to solve problems on different topics, like health, and agriculture, which are very important when it comes to access to food and also economic empowerment. Because then, when we teach people how to use technological tools, they apply it to their own lives and their own businesses. And that increases income and gives them the opportunity to have a better life.

Talking about electronic waste: it is a big problem in developing countries, because of the interaction between people and tech-

nology. So, in a site in Accra called Agbogbloshie, there used to be a huge e-waste dump. Which is also not far from a market, where a lot of people, including young people, are engaged with dismantling electronic equipment. Often, processing this e-waste is not safe. We suspect that some of the contaminants in the electronic waste might find their way into the food chain, affecting people's health and wellbeing. But thankfully the city and other authorities have been working hard to stop this dump and dismantle it. Which means we don't have a big dump at the site where it used to be. The impact of the things that have gone into the ground might linger for a while. But thankfully various individuals and initiatives are working on how to better address it. And I think that's a positive thing.

Different projects are looking at safely recycling electronic waste. As far as I know, their initiatives are around having access to better equipment that can help to extract value out of some of the electronic waste. And around not, for example, burning parts of the electronic waste in an open environment, because that leads to air pollution.

I think air pollution is possibly a new topic. People tend to talk more about the climate crisis, for example, because so much has been said about climate change. And so many people are aware of this compared to a topic like air pollution. We know that air pollution leads to a lot of deaths, but also a lot of different diseases in different countries. And we know that air pollution contributes to around 30,000 deaths a year, which are directly implicated. Looking at this danger on a national level, but also globally, I think it is an important topic that we should pay more attention to. On a global level, we are talking about 7 million people dying from air pollution, so it is a big number.

We need to ask questions about the sourcing of the components of the stuff: we need to ask where these parts come from, where the materials that these parts are made of come from. Because there are some issues with, for example, mining. How to get minerals to make electronic parts that we find in the technology that we use daily. These questions around where these materials come from – for example, were they mined in a sustainable way? – are very important. We can reuse parts from other equipment that we have used before. So, we talked about urban mining, which is getting materials from certain components. We already know there are instances where it is safer and easier to get the materials we are looking for from existing equipment rather than taking it from the ground. So, I think this is something we can explore a bit more. The design of equipment, we can look for more modularity in it. And make the design more open, so that it is possible to repair equipment when it is broken. Either the user themselves or somebody close to them can repair it, rather than relying on manufacturers. Because relying too much on manufacturers, or having an embargo or denying people their right to repair, means they would have to either buy new ones when they are not working or pay an expensive price to have it repaired. Which is not sustainable for the environment: it is not safe in the long run. This is something we can look at.

And the final thing would be the design of this technology, if we are talking about hardware specifically. It should be done in a way that we think, at the end of its life, where it will go and what will be made out of it. If we have a proactive approach to managing e-waste, then it will end up being more sustainable than it currently is. We can think about how long we expect to use this and what parts it would make more sense to include. Is there any use for these parts after the circle of use? And so on. I think those types of question are important in the long run, about how to build more sustainability into products, how we use technol-

ogy and, in particular, how we use hardware. I'm also a member of the Ghana Think Foundation, which runs bar camps where we gather, in particular, young people who we connect with mentors in different fields. It's also a brilliant way to engage with some of these topics, especially when you raise sustainability as a topic, talking about air pollution or plastic pollution. How do we fight it? How do we come up with more practical ways of doing it? And also celebrating some of the individuals who are already using initiatives in these ways and the kind of work they do.

The 'Science Cafe', for example, is basically what it sounds like: 'science' in a 'cafe'. Imagine you go to have a coffee with your friend, but instead of just having a normal conversation, you talk about topics of scientific interest; it can be a practical topic, for example something around design or software development. But it can also be very abstract, like talking about space or something like the COVID-19 crisis. It's just a way to get experts and members of the public discussing a topic that is interesting or valuable to both sides in an open environment. And without the jargon and terms, so that everyone can follow the conversation. I think that for many scientists and the experts that we have engaged in Science Cafes in the past, it is such a wonderful environment to be in. In the sense of the kinds of question they get asked and the input from others. Because there is this scientific phenomenon that you are talking about, but somebody who is a member of the public sees it in a completely different way. It is not just about your technical skills, the flow of knowledge, but also how they see it from their perspective. And for scientists who want to impact society, you give valuable feedback, from the kinds of question you ask. The kind of input they make into conversations. I think it is a very good way of engaging the public with science and technology.

What is more valuable is the kind of mindset you develop about topics, about issues and your ability to solve problems. So, the most important thing is, first, to explore and discover what interests you and what really captures your attention, because that will direct your learning. As much as possible, learn. No knowledge is useless, learn as much as possible, because at the end of the day, the kinds of problem and the issues that we need to solve – even if we look at the kinds of problem we are confronted with in the world right now – and you can only imagine when AI, biotech and the climate crisis all come together in a big explosion, there will be even more complex issues to solve. Therefore, that natural ability to be curious, to solve problems, to pick things apart, to see the big picture, and that interdisciplinary way of looking at things, will become even more important. And that awareness or that skill is important to build while you are still young. To be able to have this focus around it…but, of course, you can't go around chasing everything, which is why I said, be able to identify what moves you. You then bring all these things together to solve different problems in the course of your life, and it is important to know what is important to you at any point in time. I think that would make a difference in the world, and obviously science and technology is not just about the technical side of it. It is also about the people creating this knowledge.

And the innovation we are talking about is the relationship between those people. It's about the effect that this knowledge and innovations will have on other people, and on the world, so it is very important to see it through this human lens, through the perspective of your community and your country and the whole world. To be able to create solutions to problems is incredibly hard, but that is just one step. To be able to carry out these solutions and really make a difference in the world is another problem altogether – to be able to interface. Normally, scientists

and technologists think this is somebody else's problem, but increasingly we see that we need to collaborate to carry out our solutions. We need more and more people working together. To deliver solutions to as many people as possible. And so the ability to collaborate, to communicate, to engage, to understand, to emphasise, to lead, you know, is also crucial. There is so much ahead of you, and you have to identify that question, build it, work hard, enjoy it also and make a difference.

Interview with Hannah Perner-Wilson

My name is Hannah Perner-Wilson. I live in Berlin and I like to tinker with electronics. The fact that my everyday life is so strongly influenced by electronic devices makes me want to know more about them. I also want to create them myself. Yes, that's right, I build my own speakers. First, I took apart existing speakers to see how they worked, because I wasn't sure. I was amazed at how simple they actually are. It's just a coil made of a conductive material, which is wound to turn into an electromagnet. And then there's another permanent magnet inside the speaker. The coil is attached to a membrane, which is made from very light material. When the sound signal is sent through, this permanent magnet and electromagnet either want to repel each other or pull together. This way, the membrane, which is attached to the coil, starts to move. And when the membrane moves, the air moves, and the movement in the air reaches my ear. And when this movement in the air reaches my ear, it sounds like music, or like when you hear me speak. You hear them as sounds.

When I build my own speakers, I look everywhere for materials to build them from. I work a lot with textiles, so I have a lot of soft textile materials lying around. I usually reuse the permanent magnet from an old loudspeaker or from a refrigerator magnet. It is important that it is a very strong magnet. This means that the coil I make doesn't have to have so many turns. What I like

to do is have the membrane and the coil the same. Except that I embroider this coil as a spiral on a textile or even weave a circle by stretching a small weaving frame on a yogurt pot. And then weave all the way round.

The conductive material that is used for this coil is actually an exciting thing. Because you can use different materials. The important thing is that it conducts well. If you look at the back of a loudspeaker, it usually says 'eight ohms'. And that's quite a lot of resistance, but not that much for something that's two metres long. There are copper threads that I use, but sometimes I just use copper wire. And if it's not insulated or if I pull off the insulation, because I find it aesthetically pleasing when you can see the copper, then I have to make sure there is air between my spiral so that it doesn't touch. Graphite is also known from pencil lead. It doesn't conduct as well as copper, but if you had a really soft pencil on a really nice piece of paper, with which you can apply a lot, you could draw a conductive coil and maybe it would have around 100 ohms. Or more.

If the coil has more resistance, then you need even more force to make it oscillate. And this force is the number of volts in your power source. And you connect the grounding to one (that is minus), and you connect your sound signal to the other. And the sound signal doesn't actually do anything other than go from high (that is plus) to minus. And if it's high, then current flows through the spiral, and then it becomes magnetic; and if it's not high, then no current flows and it doesn't become magnetic. Sound signals are then actually just a vibration. Like an on/off. And when these current signals go on and off very quickly, you hear a high tone. You can also feel the vocal chords. They vibrate very quickly when the tone is high. And lower with a low tone. And that's what the current does.

So, when I'm crafting, I'm often alone, but I don't feel alone because the many materials I work with somehow become collaborative, because they bring their own properties with them and inspire me. I also really enjoy making things with other people and often do this at events or hacker camps.

That's also something I really like, this idea of care. That you take care of the objects you have, whether it's a plant or a mobile phone. So, maybe that includes repairing it, but maybe also doing things to keep it in good condition. I think we've lost that habit a bit. You just use things until they're broken, because you can buy them again anyway. But there are so many speakers in so many things. Before you go and buy one, you could think about what else you have lying around to reuse. Other reasons why I would build it myself would be that you can build and design them in a way that they are made from materials you know, and you know a bit more about where they come from. It gives you more options. How loud is it and how big is it? What shape factor does it have? They don't always have to be round: you can make a square spiral. You can also cut the membrane oval or triangular. Now I've just told you so much about how you can make loudspeakers, I'm also interested in whether you'd like to make one.

Interview with Saad Chinoy

My name is Saad, and I live in Singapore. I run a small experimental kitchen-like makerspace, the EdibleMakerspace, where we try out DIY Bio methods. One of the things that an edible makerspace does is to incorporate concepts you would encounter in a typical makerspace – which work with electronics and modules that go with microcontrollers and things like that. And because it is in the same shared space as DIY Bio, what often happens is that things they experiment with in DIY Bio tend to collide in a creative and constructive way with what's happening with microcontrollers and electronics. It lends itself to new ideas that open up new possibilities that would otherwise not happen. It is spontaneous and very creative, and it depends entirely on the energies of the people who are in that space at that time. Whenever you walk into a makerspace, you never know what you are going to get. It changes every single time.

What is my favourite material? That is a very difficult question to answer. It constantly changes as well. My favourite is whatever I'm working on at that given time. Most recently, I have been working with this homemade vegan leather concept. And it turns out it is not as complicated as I thought it was, but I only realised that once I jumped down the rabbit hole of looking things up on Wikipedia and following YouTube channels; this is often the way we get things done in a makerspace. And talking to people who have worked with different lab processes, but seeing how this could be replicated in just a kitchen, so right now my favourite material would be vegan leather that can be made from kombucha SCOBY (symbiotic culture of bacteria and yeast). Kombucha is a fermented tea. It is black tea that is fermented and produces a nice spongy layer of living material, which can then be dehydrated, which turns it into a leathery material: vegan leather.

The mud buttery experiment is an ongoing obsession of mine. My background is in tech; I'm an IT person. I got into this idea of tinkering mostly because I like the hands-on aspect of applying technology you can actually touch and feel. My job involves working with servers, and so playing with systems that you can actually hold is the appeal for me. The mud battery was again an intellectual curiosity I had to run away with… It stems from this one prompt that the number of microbes that we have in our bodies, which don't have human DNA, outnumbers the cells that have human DNA in them by a factor of 10 — depending on how you look at it. There are more microbes in our body and on our skin, which are completely alien to us and do not have human DNA in them, than there are human cells, and this idea was just mind-blowing for me, and I just couldn't wrap my head around it, which led to all kinds of question.

One of these questions was: Are there microbes that can produce electricity? And it turns out the answer is: absolutely yes. Some of these microbes that we have got inside us can produce electricity. If they are isolated. Or you build a nice little environment where they can grow, you can harness some of that

power and electricity for doing something electrical, like making a light blink. Electro-generating microbes prefer to be in an environment away from air, away from oxygen. So, you create an environment that is similar to what we have in our bodies. But the ones I have been experimenting with quite happily exist in mud, and mud that is under water. If you create an environment for those kinds of microbe to flourish, they can be turned into a battery.

in an online interview with Patrícia J. Reis and Stefanie Wuschitz

Interview with Rajina Shresta

I live in Nepal and I have been working with a feminist human rights organisation for more than two years. But for a larger part of my life, I have been really interested in inclusion in science and technology. About ways that there could be intersections between feminism, principles of feminism and science and technology, which is about gender equality in science and technology. I'm getting more and more interested in science advocacy and science diplomacy. And trying to see what that field of work could look like. At my feminist human rights organisation, there are usually young women, starting between the ages of 16 and 25, and they are usually studying at universities, or in their early career. And they are very much embedded in the feminist principles, and many of them are into science and technologies.

We work with several different types of people: there are very, very young rural women and also experienced human rights defenders. The work we do is around their leadership, but also sometimes around their safety and security. The digital world around us, that they operate in, might be beneficial or useful to them. In Nepal many people have access to smartphones, although we are not a very rich country. Several studies show that it is also because Nepal has a lot of migrant workers, who bring back smartphones for the family to use. This has really

increased access to phones, in the last decade…access to the internet has been increasing. Access to the internet for young women in rural settings is quite high. I'm not sure if I would say the same for rural women. That does not mean that there would be privacy, because most young women have a lot of policing on their social media activities. Their brother or father or aunt coming and saying 'Why did you post this? What did you mean? You should not be saying these things on the internet.' Patriarchy is guiding and watching their internet activities.

I think we see technology a lot like magic, you know, it is something that someone else has done. We are considered consumers of it, we didn't make it, it happens to us. So, we move our life around what it gives us. So, for example, we all have smartphones – many of them have location tracking. I have heard from many people how knowledge of being able to share your location on your phone becomes a tool for families to police where their children are going, especially their daughters. Making it mandatory for young girls to share their location with their family at all times. It is more like a tool that comes to us and we eventually move our lives around it. And no matter what – patriarchal, capitalist and other values move around, making the best use of that technology.

We can react in multiple ways, but there are two big ones. One is to work around the technology, for example being able to really support more open source technology, where we know that there is some accountability, and we know what kind of data information they are taking from us, to be able to make an informed decision. Or to go to another software that perhaps does not take as much of that information, for example using Signal more than WhatsApp or other messaging applications. The other big one would be really working around our own community, because we need to change the way people think. Privacy is not regarded as a real thing in the lives of many of us. We are not allowed to put locks on the doors of our houses. We live with our families for a long time and privacy is not a concept that is taken very seriously. To see that translate into digital and

other mediums is not very surprising. So, a lot of work needs to be done within our communities to give importance to privacy and what that means in young people's lives – to live that with their full agency as well. (...) New smartphone cameras can zoom in and really do not consider anyone's consent.

Sometimes we walk out of our houses and there are CCTV cameras everywhere, and we also did not consent to these. I think it needs the involvement of not only more women in the development of these kinds of technology but also more feminist people. Or more people who are aware of the kind of risk that can come with such tech, especially when it comes to surveillance. (...) If perhaps, first of all, there were enough people who cared about this, then perhaps the technology would have been made differently or within our regulation policy. (...) As I said before, in a lot of our cultures privacy is not something people take seriously: we don't lock our rooms, and it is considered rude to do so. The same way I felt like consent in people's private space is not considered to be bigger than capitalist structures. And that's why this device was considered suitable to come to market.

It doesn't mean we just need a regulation for people who work in the phone company. We also need a general understanding among people about not being okay with being filmed from ten houses away without knowing you are being filmed (...). In many computers the webcam is connected to a light near the webcam. Fewer technical skills are required for everyone who uses a computer, but there are enough risks out there from people trying to hack into people's systems to be able to use people's webcam and silently record them, blackmail them, etc. A simple ethical design where it is not possible to switch on the camera without the light also being switched on is a really good example of taking on that responsibility, understanding the risks that come with the product, and minimising those risks. And doing all this even though the product might stop working, in case someone is trying to bypass that level of security. Particularly in devices that a lot of people use without having sufficient technical knowledge.

Interview with María Antonia González Valerio

I am a philosopher. As a full professor at the National Autonomous University of Mexico, I specialise in teachingaesthetics and ontology. My research is centred on the philosophy of nature and art-science. (...)

The production of technology is not ethical. Many of our technological products are fabricated under terrible labour conditions, exploiting workers. We know this. Who produces what we are using? That question cannot be answered. On the one hand, it cannot be pinned down to an actual individual; on the other, the chain of production is normally black-boxed. How many countries, regions and territories are involved in whatever technological product we want to think about as an example? How many seas were traversed to deliver the product and the many pieces it is composed of? How many people are involved in that process? How much pollution? How much exploitation of workers is there at every level, in the factory, the cargo ship, the retail shop and the mines where they extract the raw materials for our fancy tech products? How much?

And about the land, where is this being produced? How were the land, region and territory transformed to host so many factories and industries? How much water is being used by the industry? How many birds are affected by the pollution of this industry or by cutting down trees to build the factory? How many mines have entirely destroyed the environment? How much waste has all this produced? But who is accountable for the exploitation? For the destruction of biodiversity? For the pollution of the waters? Who is accountable for turning the oceans into shipping lanes full of containers and the waste they produce, including the combustibles that they throw in the water? Since almost everything we have, use or come into contact with, almost everything, comes through the oceans. (But who is 'we'? Who is accountable?) The question is not about the consumer. The guilty, stupid, weak consumer that cannot help

themself from buying goods that come from who knows where, that were produced in terrible labour conditions, that destroyed the environment, that impoverished whole 'third world' populations... The question is not about the consumer and their 'carbon footprint' and behaviour, and not being able to be good enough to act with honour, to be fair, to procure the wellbeing of their community and of future generations. The question is not about the consumer. Who can be held accountable? Who is responsible for taking accountability?

The solution is not a 'green economy' that will save 'us' (Who is 'us'?) from doomsday. We shouldn't fool ourselves into thinking that this has to do with consumer behaviour; that is about having sustainable behaviour (How much plastic have you used today, and what about your carbon footprint?) ... What kind of shame and guilt hang upon those who do not comply with the new morality? There is a lot of greenwashing, whitewashing, artwashing... But why should we trust capitalism? It seems that the kind of technology that we have under a capitalist, colonialist, Western patriarchal model is not very ethical. So where to start? What could be a good starting point? Maybe it is not about rushing to invent new solutions (Why should we trust technology?) but about thinking deeply, calmly and with tranquillity. Thinking about what we are instead of avoiding ourselves and throwing ourselves into so much newness, so many new things, ideas, devices and art projects to change the world and save the planet. So many... But what are we? What? Could we think outside technical solutions? Could we? And what would that be? What?

I would contribute with silence and time; that is, invite people to be in silence, to feel what there is, to deeply interrogate what we are (what you are), to breathe with consciousness, to stop talking and rushing into the next question, the next solution, the next... Just stop. What issues are closest to your heart when it comes to your home country? On one side, the deep sorrow because of all the terrible violence that my country is suffering, the deep rage because they are destroying the country,

inflicting much pain on the people, because they (Who are they? Who is accountable for?) want to sell more weapons and make more money to nurture the corrupt banking system, including offshore banking. How to explain the violence inflicted upon us so some can get richer? On the other side, the fantastic food that Mexican gastronomy is so famous for also represents an identity, a relationship with the land, ancestors and tradition. Mexico is so full of colours...

That your truth is not the whole truth, that your viewpoint is not all there is, that whatever you have learned, there is another side to the story, and that it is our moral duty as thinkers to bring about the other stories, the ones that have been buried, the ones that have never been heard. There is more than the mainstream history of the world, your city and even your family. How many stories could be told about any fact or idea?

in written interview with Patrícia J. Reis and Stefanie Wuschitz

Interview with Irene Agrivina

My name is Irene Agrivina, but people call me Ira. The perception of water in Indonesia, where I come from, is very different than in Europe, and mythology plays a part in this perception. I live on Java, where the perception of water is quite distinctive. Water is a holy thing, a gift from heaven. We call it 'Nirvana'. It is part of the way we live. When I was growing up, water increasingly became something that is owned by capitalism, which felt strange. Water became fancy; suddenly, people could no longer afford it. To me, my family and the people around me, the fact that we have to pay for water is strange. It is a gift from nature, according to Javanese philosophy. So my intention is to create access to water. To do this, we have to relate to nature again. Water is just a part of nature actually. Access to clean water is a fundamental human right (...) There are many different types of waste, not just e-waste. Waste is thrown into the ocean, into the sea, in Indonesia. Medical waste is also thrown into the ocean,

which affects the water quality. In the city, in rural areas, this affects food production. When I was in Germany, I think last year, someone even offered me a business — a big business — throwing waste into the ocean in Indonesia. I believe it is thrown from a ship (...).

I think there is one electric circuit, which is really easy, and it can be connected to a sensor. So I always teach people how to make it, and then they can turn it into a water-quality sensor to see whether or not the water contains a lot of metal. It can also lead to an artistic project. And for the kids it's an easy project to start doing bio art or observing other things. If you add one part, you can learn about electro magnetics, which is nice because you can then hear a sound. It's a basic sensor that can lead into everything: artistic projects or science projects, depending on what one needs. It's a fun thing if you want to know more about hardware. You can also connect it to Arduino and program it; it is very easy to detect metal and microorganism contamination (...). We can use it to compare the chemical fertiliser in the rice field with the bio fertiliser. We were working with a Muslim organisation in Indonesia whose vision is food and energy independence in Indonesia. And we are working with several others...who have their own land — a small piece of land — and they are doing DIY to build a sustainable system, which we support. When we were successful, we thought this was actually really good and we could adapt it to other rice fields. But the quality of the rice is really bad. And we have to use these fertilisers that genetically modify the rice plants, which is why I created the project.

Interview with Milton Raggi

I come from Cuba, an island in the middle of the Caribbean Sea. I do art, I also work as a teacher, I organise and curate exhibitions related to media and tech, sometimes I write, but mostly I collect a bunch of trash. We don't really have technology dying, or at least how we would consider technology dying in places like

Europe. Basically, we are very much used to repair, and repair and repair. And when an object can no longer be repaired, then we upcycle or we transform it, so it's in constant mutation basically. We just use it as something else or we transform it into something else or we just decompose and use parts coming from different sources.

But this is not something that only concerns technology. It's also something we apply in our everyday life to basically everything. It's the way we use to subvert reality. We don't have access to many things, because of the political and economic conditions of my country. We are limited to the resources, and therefore we need to put a lot of creativity into the things we already have. If a coffee mug can also serve as a plant potter, then we use it as a plant potter, and so on. Let's say you want to generate a bit of electricity. Just at least for learning how to do it. Because sometimes we take electricity for granted and you just plug something into the wall and there you have a lightbulb going on or a machine working. But knowing how to generate electricity and knowing how electricity works is a very powerful thing. Because then you start realising that you are not so dependent on what is given to you and what you took for granted, and you can actually create it yourself. And I think that empowers you, knowing that you can build things and that you can build your own electric supply. And therefore having light or a machine working, and so on. So, starting with that, I think we should all learn a bit, in a way, because that way we can build a better future. If you are curious and if you want to start exploring this idea, it is as simple as taking a motor…

online interview, Patrícia J. Reis and Stefanie Wuschitz

Interview with Seyram Avle

(…) I care about who makes technologies, especially in places that most people think don't have technology. Think of Africa or (broadly we call it) the Global South. And how people in these

places use the technologies that are produced around the world. So, on the one hand, I think about the entrepreneurs, the designers, the academics, the people who imagine different kinds of technology and what to do with them. And then, on the other hand, (...) how do people come to these technologies and use them? What do they imagine these technologies to be, and what do they want out of them for their futures? It matters where hardware is made. First, locally and, second, in places that are not considered the centre of innovation. For a number of reasons.

One reason is that it is sustainable in terms of the localness of it all. Dext, which is a start-up company in Kumasi, Ghana, initially started making science sets. Which is a kind of mathematical set. You take it to school, you use it to do experiments. They were repurposing local materials. They harvested things from old photocopiers (...) Ghana receives a lot of discarded electronics. So, they wanted to see if they could repurpose and reuse some of these things. (...) They were trying to find local materials to make everything from scratch. It was a very labour-intensive project. But they had the idea to do it, because they knew there were things they could repurpose, and they wanted young people in the area to have jobs. So, they created a company. And they care a lot about science and the teaching of science. So, they wanted to give practical examples to students. Dext designed a very simple science set that they could build from local materials, and for a long time it was really difficult. In part because you don't get everything you need to build the science set. So, they had to be creative. The bigger they got, the harder it got too, because then you need many, many materials, which don't all come through the usual ways. That's the local sustainable aspect of it.

In terms of broader issues – of being in a place that is considered the periphery or not the centre of innovation – it also means that things cost more, you don't get the funding for tech. Companies in Silicon Valley, or even some European-based companies, find it very easy to raise money. But if you

are from Africa, from within your own country, from within the Global Capital Network, people don't believe you have the expertise, they don't trust you, they think you don't know how to do things. (...) For them, being able to succeed in their country without relocating mattered, because it could prove and show that they could do these difficult things where they are. That they could build these incredibly helpful things. And so, in a sense, you could say they are trying to resist a classification of them as a certain kind of producer. Like 'not being able to make technology'. They have been able to reconstruct educational curricula to go along with the science sets. (...) So, in general, I think that example of Dext is really crucial in terms of how the young people who build technologies see themselves, the challenges that they choose to resist, to a certain extent. For me, it's worth telling and understanding. (...)

Feminists talk about care as both a way of thinking through community but also as resistance, because capitalism does not WANT you to care. The way that systems are structured inherently creates competitiveness and an ethos of negativity. (...) And so, being able to support one another and build things together, a physical space, is necessary, right? So, you can build this comfort, you need to gather the people you want and need, and have the space to think and reflect on how you might insert some kind of change, right? They do that through their everyday actions. But it is also very intentional, and it is important to insert care and the ethics of care within technological discourse. A lot of how we come to this discourse around technology does not demonstrate care; it's exploitative. From companies taking your data without your permission to being watched — all of these things are not demonstrative of care. So how do you enact care practices within this kind of hostile environment? By designing and building things or even just drinking tea together on a daily basis. We see these community-building practices as essential aspects of thinking about technology, because this is how everyday people respond to these macro-level things like capitalism and geopolitics of technology. (...)

Kwame Nkrumah – Ghanians like to say he was ahead of his time. In the sense that he was the first president of a country that had been under colonial rule for a very long time (...) Ghana was part of a group of countries with leaders who did not want to be forced to align with either the East or the West, because they found this sort of alignment would work against their own progress. And the ideals they had for themselves. Nkrumah had this vision where the new state of Ghana would plot its own path. And that path would be forward for its own people. He was very much about 'How do we as a black African nation prosper in a system that was not designed for us to prosper?' 'Things have been extracted from us for many years, and now there is a war somewhere else and we are forced to join it. How do we resist that?' That is what this quote was about: 'We face forward': for our own purposes, our own improvement and not being forced to participate in a cold war that does not serve us. He was speaking mostly and primarily about Ghana, but also, because he was a Pan-Africanist, Nkrumah was really crucial in getting different African states to unite. He thought unity and collaborative work and community was a strong way to resist these structures that these newly independent nations across Africa were finding themselves in. Nkrumah wanted a united Africa. So, in each of his quotes there was always a double connotation to it, because he would always speak about his own nation state, but also about Africa and black people generally. Nkrumah was a Pan-Africanist and very much cared about black solidarity. But also solidarity in the Global South against colonial powers (...)

This is a problem in Ghana, but also generally and globally, there is this 'revisionist historicism' happening, where people attempt to rewrite history, so Nkrumah is progressively being written out of history in a way that is quite startling. Politics, big politics, always interferes in a way when someone is being really radical in their thinking (...) so his legacy has not continued as much as I would have liked.

in an online interview with Stefanie Wuschitz and Patrícia J. Reis