As part of the study, "Biofibre Explorer: An Augmented Reality (AR) Tool to Promote Circularity Through Material Knowledge," participants were asked to answer the following question after using the AR application.

What did you just experience?

Total: 38 descriptions

Final Study

Participant 1

I've used the augmented reality tool to explore how, from the bacterial cellulose, we can create textiles, and in four phases, I've seen the entire process, and it was really interesting.

Participant 2

Yes, I experienced the process of taking cellulose fibers, breaking them down, spinning them into yarn and weaving them into a garment.

Participant 3

Actually, I just experienced something unusual I have never seen before. How the bacteria can transform to yarns and how we can create from those yarns outwards like a t-shirts in that case.

Participant 4

So from what I got from the first one, the idea is to bring some liquids into it to dissolve the paper-like material. And then with it dissolved, if you put it into this other solution, I believe it was another solution that you can remove the ionic liquid, I guess. And then you only get the filaments of the dissolved paper. With that, you can make yarn and then make fabric again.

Participant 5

Well, I used an AR app to look at how biomaterial is produced or how biomaterials thread is produced with the kind of steps involved. And I thought it was a really nice kind of step-by-step process. It was very, very clear kind of how the different components led into each other. So that was nice.

Participant 6

It's like, sort of, I guess, trying to turn cellulose, which is not really stretchy, into a filament where the chemical bath and then sort of turns into a thread and then gets washed in and spun and, yeah, and turned into fabric. Yeah.

Participant 7

I've experienced seeing how textiles can be made from a mixture of bacteria and something else and cellulose. So, there's a breakdown of the cellulose with a particular type of fluid called ionic liquid. And then bacteria is added to it, which then builds the material, and then it's put through a, a what do you call it a syringe or something or, and then sort of extrude it out? So the filament is created, or is it spun run? Yeah. And then what happens is that that filament or yarn that is created is then put through a bath, a water bath and spun through through a not sure what it called. I can't remember, but it spun through onto a spool. But the way that it's spun and, I think, also the water bath, ensures that it is strong; the yarn is strong. And then at the end, what you get is a nice cellulosic fiber that can then go back into the system. You create a garment with it. And so it's quite a good system.

Participant 8

I looked through the screen of the phone and pressed the button and was directed at every stage to understand the process.

Participant 9

And I mean, I, I step through the process if you remember. Yeah, so the cellulose material gets put in, like, an ionic fluid with a K and an anion that sort of create a solution by which it can then be drawn out into a, into a yarn. And, and I mean, I assume that the cellulose has quite like long chemical structures that allow it to, to bond and have some tensile strength and then that then gets washed in a doping solution and then, and then used to make wearable fabrics. Is that about right? Yeah.

Participant 10

I think it's great to see the different steps priorly to finding a product and seeing the origin of like material processing, which is quite fascinating. And yeah, I think interaction is great. It's not just like what is showing how to say the step by step, but it's also I like that. It's allowed me to interact with you, and it's the bottom and a nice animation, but it's quite satisfying compared to, like, seeing the instruction and plain text, or you would like static 3D modeling. So, I think this is much better than the traditional way of presenting step-by-step instructions.

Participant 11

So you take the cellulose waste, and with some ionic solution, you prepare the filaments and then dry j spinning. I don't know if that's the word. You turn these filaments into yarn. And I think that's what I got from the experience; we will see.

Participant 11

So I saw a liquid with ionic and an ionic elements in it to which a cellulose sheet was applied in the second stage, and it was put into a whirling motion and out of on the third stage, a new yarn was created which was then spun to create a new yarn basically. And the cellulose sheet that was had had bacterial basis like the SCOBY in a kombucha basically. So it's the same. I think that was the same as the first thing I saw. And that's what went into the liquid, which then created its, you know, the transformation, biological transformation, which allowed the fabric to be not fabric, the thread, the thread to be created.

Participant 12

So through the augmented reality on, on a mobile device, I saw how I saw the process of taking old taking the enzymes and breaking down the ionic and cic compounds to create sort of like AAA new liquid that can then be spun into polymers and then eventually into yarns and threads for a for a new product. So it's like circular, breaking down of previous products into new products that are more sustainable. Yeah.

Participant 13

Sure, I think what I saw was the process of converting bacterial cellulose to a bio fabric, a biomaterial. I could tell that there were four main steps, and towards the final step, you had to do the winding process in case there was some sort of contamination. I understood that the role of bacterial cellulose was that of keeping the material together, which is a bio, which is some sort of a bio extract, which I'm assuming. And then that at some point, it translates to a material called dope which ultimately spun into yarn and then eventually the yarn spun into the fabric.

Participant 14

the experience of looking at how bacterial cellulose can turn into a yarn and how the yarn is then coiled up to make a garment out of it. That was, that was what I experienced, experiencing it in a form without having the actual bacterial cellulose and without the touch and the feel. But still, I could understand how it would have been if I had it in front of me, if I would be touching the bacterial cell squeezy, like a spongy texture.

Participant 15

Yes, for me, of course, it was a challenge because I'm not used to this kind of. But then it was very joyful, easy way through this little pur I would just say, yeah, it was like it is. So I think it was very accessible. So to me, so very and I like the, I like the design of it. Of course, of course, it was, yeah.

Participant 16

Learning about how to make how to make a yarn, how to make a textile out of that have already recycled textile. So how transform two losses into a yarn which can be used to make a shirt?

Participant 17

I watched how cellulose can be transformed into textiles by undergoing different processes that kind of turn it into a filament into yarn, and then ultimately into clothing.

Participant 18

An augmented reality, I guess, an educational kind of game that helps us understand the process of breaking down cellulose or producing cellulose fibers.

Participant 19

I've just experienced an augmented reality process of converting what is perceived as a waste material with scientific processes into a productive material. And it was a way of essentially dissolving a substance. And then from that, creating a usable fiber. And it made me understand how something that's really technical that my brain doesn't comprehend, can actually happen in a very practical and simple way.

Participant 20

So it was the process of not extruding wet sp cellulose. So it was dissolving a sheet of bacterial cellulose into a certain type of liquid, which I've forgotten the name of and then the process of collecting that in a syringe and then extruding it through a bath and winding it onto a winding things to make a, yeah, a fiber for a fabric.

Participant 21

It was an interactive exhibit on the process of drying jet spin cellulose fiber from or to make a recycled material.

Participant 22

It was a wet spinning process. So the extraction of cellulose turns it into new fibers for building of materials, therefore, shirts and et cetera from that.

Participant 23

Well, I've, yeah, I've kind of, it's hard for me to kind of grasp because it's very scientific for me. But it's my understanding that it's how you can extract materials from combined garments. So, like, if you have a garment that's made of several materials, you'll be able to take one from there and reuse it. But that's, like, that's the only thing I kind of got from it cos it's quite hard for me to, like, hold all the information. If I'm not, practice it if that makes sense.

Participant 24

I experienced AR-generated information about four different stages of the process of creating cellulose into clothing.

Participant 25

It was very interesting to be able to almost play with the display. Like you could, I like that. It was not just to scan and see it in AR, but it required an additional step to click on something or press and hold something and watch it happen.

I also like that you could move the camera around and see the thread spinning onto the spool and going into the dress, and you had to actually engage with it. And it, it required me as the person experiencing it to actually focus on it and not just a lot of things with A R like with a, you know, with the social media filter that is also A R you don't really think about it, you just kind of click and move on. But I like that this had a few extra steps that required the user to kind of really engage with it. I will say though, like I come from like a fashion background. So some of the terminology was I understood it. But I do think that if someone completely new came into this, like if you told them extruder, they may not really understand what an extruder is. So some of the terminology was a little bit jargony, which was something that I noticed.

But I think for someone who has like even a little bit of base-level knowledge of textiles, it was awesome.

Participant 26

I saw the process of bacterial cellulose being turned into textiles. A lot of the details kind of went over my head. But I understand that it's a more sustainable way of making clothes, and yeah, that sounds really cool.

Participant 27

So I was pouring some, some kind of wet solution and then putting in the cellulose which then which is from like old garments and stuff like that and then that can then be made into new garments by this whole process that I just went through.

Participant 28

I have just experienced basically the creation of textile and the shirt from cellulose, and maybe there were two other things as well. And I, in my understanding, the reason why this is interesting is because actually, actually it's a good question. So I understand, I understand the process that it is it is that it's cool that you have this material that you put into water and then it becomes this kind of filament and then with the filament you can make a textile. I got that the one thing that I don't really understand, sorry, I'm just asking questions, is basically, is that why is it exactly sustainable? So I, because I kind of forgot what the initial three ingredients of that material were. Sorry, it's good.

Participant 29

I experienced the process of processing bio-cellulose through a sequence of various how do you call it through a process? Yeah. Through a sequence of different chemical manipulations

with the cellulose and then going through the whole cycle from the molecule. So to say to the material itself.

Participant 30

It's like the making process of the filament and then kind of like into the yarn.

Participant 31

It was an augmented reality space through this like small mobile-like phone screen and sort of it was a, a what I saw was like a demonstration of how cellulose is made. But I didn't really understand why I had to see it through an augmented reality space. So it would be kind of good to see why it was beneficial for me to see this process through a mental reality. I think, second of all, it was really interesting to see this physicality kind of recalibrated through the, this is like, digital realm and definitely makes it a bit more interactive to kind of understand the scientific process of it. And yeah, I think it was something that I wouldn't have seen elsewhere unless I had this sort of specific tools and apps and equipment. So what experience would be something a bit more democratised? So it's easier to approach.

Participant 32

This is something to do with you got some, some, some ions, things like this. So that's my understanding of this sort of situation here. We've got some, some, some liquid. OK, where you take the ions out of that and then that's my understanding. I've done very well. So have I, and then, and then basically, it's, then it's then spun a little bit, and after it's then spun, it can't dissolve in water. It's not, certainly won't dissolve in the water is then shing out; it's then shing out of that.

And that's I presume that's, that's the cellulose which comes out of it. And then after that, it's then put into a it's then spun onto a wheel. OK, where the cellulose is made into some form of a yarn and the yarn is then commercially produced to actually produce a garment.

Participant 33

it's a kind of augmented reality experience going through all the processes of taking bacterial cellulose and spinning it into thread and then weaving it into a fabric. I don't know what's more than that. Yeah.

Participant 34

So I enjoyed the whole exhibition. I'm particularly interested in the production reuse of bacterial cellulose. And that was really interesting and the core aspect of making clothing with both the consumer and the designer like. Yeah.

Participant 35

Yeah, basically what I experienced was how the bacteria cellulose is gonna to work and really, the visual, and I can also kind of participate in it and yes, it's very brilliant. I really loved it. Yeah. Thank you.

Participant 36

I feel like I have seen an exhibition. So, you know, sometimes you go to a museum or gallery.

The technology is always not working for you, You're supposed to watch something like a facility, or they would like to do something. But then they was broken with too many people round but I feel like using the A R technology, I can actually see I can see something, it's in a real table but some animation like a ve very like a three dimensional thing. And I can, I can see how, how we made a very bio based textile. And I understand more than reading some text, and because it's animation, I don't feel like I'm actually watching a movie. I can still feel the environment I'm in a gallery, and I can still see the table and everything.

I also had a good understanding of the process of how you made the textile from scratch and at the end. It becomes close. Fantastic.

Participant 37

You have bacterial growth in Ions, and then it gets extruded by an extruder to fiber.