

## Exploration phase: Student focus group transcript 07/03/22

Anonymous Participant Code
FFG F
FFG G
FFG H
FFG I
FFG J
FFG K
FFG L
FFG M

Interviewer: So, what we will be doing with the focus group, and thank you for participating. Is we are going to use a technique within the focus groups so there will be time for some individual reflection, time for some sharing and time for some discussion and then we will look at doing some voting as we go as well. And I will be using all of this when I design the approaches and in that process evaluation. So really trying to include the voices of people who are involved in receiving fieldwork and digital fieldwork to make sure they meet the needs ultimately.

So ultimately this is what we are going to looking at. I am really trying to think about how do you guys view and value fieldwork? And by fieldwork I mean the fieldwork you do in the field, in-person but also some of those digital or virtual fieldwork approaches aswell. So, I am just going to skip ahead and we will come back to some of these. So, bear with me. So, this very first question, so this is the first question that I would like you to ponder. I would like you to, just on some scrap paper that you've got around to think about.

What are some of the defining characteristics of digital fieldwork that you have perhaps experienced or come across? And really try to think about how do those enhance existing fieldwork provision?

So, in a kind of dream world, or best practice. What do you think are some of the defining characteristics of a digital or a virtual fieldwork approach? So, I am going to give you some time, individual reflection, you can make some notes and we are, I'm going to ask you individually to share those. And I will make a note of those as we go.

**<Silence for individual reflection>**

Interviewer: And just a reminder, and I know it is still on your screen as I am still on share. But thinking about those defining characteristics of digital or virtual fieldwork, and really thinking about how those might enhance existing fieldwork provision?

**<Silence for individual reflection>**

Janine: And I can see some visual clues, so I can see some people look like they have stopped. And some are still scribbling but if you did want to give me a thumbs up, that can be quite a useful emotion, reaction for me just to know that you have had time to think about that question.

**<Thanks to individual participants who responded with thumbs up>**

Interviewer: So, what I am going to do, I'm going to invite you, and unfortunately it will be me selecting who is next because it'll be on my screen if that makes sense. But I am going to invite you to unmute yourselves one at a time and talk us through what you think are some of those defining

characteristics. If someone has already said one of yours, say it again, but I will make a note that someone else has also thought that that was a defining characteristic. Ok. So, I am going to be recording these, so we will be able to have a look at those as we go and when we come back to those. And I'm working on one screen, so very much multi-tasking. So FFG F you're first on my screen, will you be able to share what's on your list first? Would that be ok? Thank you.

FFG F: Was that me?

Interviewer: Yes, thanks FFG F.

FFG F: Er yes, so I wasn't really sure of the key features. But I guess the main thing is that it can be done from home. So, I guess I was working more on the advantages, than what the key features were. But a big one is accessibility which is quite a close one to me. Because well I've developed chronic illness in 3<sup>rd</sup> year and wasn't able to do my fieldwork module. Which they then switched me to another theoretical module instead, which was fine, but still being able to gain fieldwork experience without having to like go. And also like from a cost perspective that would make it more like accessible for people who can't afford to travel to things. And then I thought another good thing about it was being able to explore lots of different like environments, that you might not be able to on one fieldtrip otherwise. So you can do some desert fieldwork, some rainforest fieldwork all within one module. So yeah, those were kind of my thoughts.

Interviewer: Lovely, thank you. So, I've popped you down for your comments of some of those defining characteristics were access from home, it's remote. Something else you talked there about defining characteristics were accessibility in particular to increased access to fieldwork opportunities, and accessibility with reducing costs as well. So, increasing access to all for fieldwork, and accessibility with reduced costs to other fieldwork opportunities. And also you talked there about, defining characteristics about there about exploring different environments. Environments that you might not be able to visit normally. So, thank you FFG F, really great to hear your views there. FFG G are you ok to go next and share your thoughts? So those defining characteristics.

FFG G: So, some of mine are quite similar to FFG F's. I said done online, done remotely. And then using like Zoom, Teams or similar to communicate with other people you are working with at the same time. Erm and it quite often, it'll be using data that someone else has collected. Or like collected remotely so satellite stuff. And I just said like good back up for bad weather, or pandemics or like financial costs. And just being able to explore different areas as well.

Interviewer: I'm just recording these as we go. Perfect thank you. So, I've got the fact that using those synchronous communication channels such as Zoom, Teams those type of things. You talked about using secondary authentic data or some kind of secondary data set. Either collected by someone you know or much broader data set. But it is authentic secondary data that you are using within those. And also, you were talking there about those different environments. Yeh thank you FFG G. FFG H Do you want to share some of your thoughts?

FFG H: Erm so I also had that it was using secondary data, erm other people's data. I also potentially thought it could be more repeatable because rather than being out in the field, its less swayed by the bad weather. Or the things that would cause anomalies. So, it's more can be repeated, or can be looked back at, at any time. Erm I then also thought potentially, if you were using modelling and data analysis rather than collecting, researching on the present, you could use the data that you have got and forecast for the future as well so rather than now, you're using what you've got in another way. That's what I've got.

Interviewer: Lovely thank you. So, I've added to our list, and I'll share this in a moment so you said, we're looking at repeatable, you can look back over, repeat certain parts. And then you were adding to that almost temporal aspect of fieldwork, erm so modelling but also thinking about looking forward forecasting into the future, to those things which are more challenging in an in-field or in-person fieldwork experience. But you can perhaps do those there. Lovely thank you FFG H. Er FFG I do you want to share some of your thoughts.

FFG I: So yeah, this is kind of similar to some of what FFG G said but you look more at processing the data rather than collecting as it is secondary data. Which I guess means you can give more attention to that as well because quite often do in class like theories of equations, but if you're kind of doing the fieldwork at the same time it can make the connections between the processing more clear. Erm and also just to generally emulate like in-person fieldwork like as much as possible, within the restrictions of you can't actually be there, and like in doing that, giving contexts for what you are looking at. Not just showing you a picture of a field, and being like here is a field, count the daisies or something like that. Giving you the situation in the location.

Interviewer: Lovely, thank you. Really nice to hear all these thoughts, and I'm adding to this list. A focus more on processing data, that analysis aspects, and connecting that process to the data collection. You've talked there about trying to emulate as much as possible that in-person experience. And then also you've talked about giving context and background to a fieldwork situation if it is presented digitally. Lovely, thank you there. FFG J you are next on my list. If you want to share your thoughts.

FFG J: I think we are getting to the stage where we are not going to hear very much new. Probably not from me. Erm so I've got a few of the things that have already been mentioned so carried out online in students own time. Not necessarily simultaneously with everyone else perhaps with their peers. Erm I also feel like if I can express this succinctly. Erm it's possible that whatever platform is being used, for the for virtual fieldwork might only allow a limited number of responses to questions, or a limited number of relative flexibility in responses to questions or actions. Compared to if you were actually there. Erm and I mean, I won't go into limitations of that right now because that wasn't the question. The other thing that occurred to me about the accessibility one, it may allow students to visit localities they couldn't otherwise visit. But like during my degree, our University as part of all university there was one fieldtrip. And it was possible to go abroad to Central America for that trip. There was lots of different trips, but anything that involved going overseas you had to pay for. And you had to pay transport, quite a lot of transport to go to Costa Rica. Anything that makes tropical rainforest accessible for fieldwork in the UK is probably quite a good thing.

Interviewer: Lovely thank you for sharing those. So, I've added to that list is that there is something there about it being asynchronous. So, learners can access in a time that works for them. So, in their own time, rather than say a set structure, that you may have on a fieldcourse. You've talked there about perhaps the digital fieldwork has a defining characteristic that is more of a rigid structure, maybe some more limited responses, in what you can get. And then you've commented there about exploring places you couldn't normally visit as well. Lovely thank you. FFG K you're next on my list.

FFG K: As FFG J said it's all pretty much repeating. It's online, its secondary data. I was also thinking about like modelling. It makes it a lot easier to model data when it is already on a computer. Erm then accessibility, the same as FFG F, I was thinking about chronic illness. Erm and if you have chronic illness both timing and being able to do it from whatever resources you need around you to enable you to do that. Erm and then also financial but I think somethings you can afford and somethings you can afford if you really want to do them. And I'm thinking about some of the young

people who I work with who might be able to afford something if they really wanted to do it. But maybe it wouldn't be a top priority if they're Year 10, Year 11 or something like that. It's probably not a top priority so they can access stuff that like, yeah it accessibility isn't it.

Interviewer: Lovely thank you there. I have added to our list. I've added that the fact that it is easier to model because our data is presented digitally. So, our fieldwork is a digital collection. And then also you've added a bit more to that accessibility angle, talking about those perhaps those learners who may be experiencing chronic illness to who can access the fieldwork environment but with their existing support structures in place. And you've talked through that. Lovely thank you. FFG L should we come to you now thank you.

FFG L: So erm a lot of what has been said already really erm I think one of the things that I think would be good for is expanding upon in-person work. So, if you are comparing a place that you could visit locally, and then somewhere further afield. You could get a more in-depth understanding of how places compare. Erm I also think digital fieldwork its recently become a much bigger thing especially with covid, erm and one of the benefits of I've experienced with it at Uni, is that it can be recorded. And which was useful for revisiting, especially if you wanted to reinforce, what you've learned or if you've missed something. Erm and I think it's good for an overview but it does lack that hands-on experience.

Interviewer: Lovely thank you, so for those defining characteristics I've added that it expands upon in-person. And in particular you've mentioned there that comparing with a different place, comparing and contrasting, and also you've talked about that ability to the fact that it's recorded you can revisit and reinforce. Erm and you've also talked there about that it provides an overview of a fieldwork experience. So, thank you and finally FFG M. You're the last one on my list, hopefully just double checking I haven't missed anyone. FFG M would you like to share your thoughts on defining characteristics.

FFG M: Yeah sure so I think one of the great things I think about it is as we are, it's not necessarily just about the fieldwork itself but something I remember myself really enjoying is going to places in person. And because it's fun and engaging, erm but one of the benefits of online fieldwork is that there are so many more tools that you can use or software that you can learn to use erm and getting people familiar with it but its really helpful for them in the future because then if they learn how to do it now, whilst they're younger it makes it much more easier for them in the future. Erm and as you know they start to learn these tools and these different ways of gathering data about that it can be really helpful and it can also broaden their horizons and make them realise; "Wow you know working in these areas might not just be going out into the field and counting daisies." It can be this vast range of different things and opportunities.

Interviewer: Lovely thank you. So, I've added to our list, and we will take a look later on in our focus group. But I have added there that a digital fieldwork a defining characteristic it could be that we enable learners to look at more tools, different software, and that can provide digital skill development opportunities which we think might be worthwhile and you've also talked about opportunities to broaden horizons within a digital fieldwork. So how digital fieldwork could broaden those horizons. Lovely, thank you.

So I'm going to keep that and we're going to come back to that later on. So, our next little section is going to get us to think a little bit more openly. So rather than it be a closed person by person, it's a much more open discussion, so do feel free to raise your hand, unmute yourself as when you will. But it is really thinking about your experiences of in-person fieldwork so that traditional outdoor

fieldwork approach. But I am really interested to hear the challenges but also those opportunities of in-person fieldwork. So, I'll come off the mic and I'll let the conversation flow between you guys.

FFG J: I suppose what springs to my mind. Is part of my first degree which was Geology and erm the, obviously the advantage of being out there is that there's the opportunity to do fieldwork which every Geology student has to do, is that there is an awful lot that is difficult to get across in a lecture theatre or a lab or a hand specimen of a rock or what have you. Erm you really need to see outcrops, to get an idea of say the scale to get an idea of how things are arranged spatially. Er that kind of thing because diagrams are always idealized. And idealized diagrams could be difficult to relate to the field. The challenge of course with that is that it typically involves going to quite a remote place, err typically involves going over quite rough terrain; and that's not accessible to everyone. Erm the, we when I first started, we were given a whole list of good Codes of Practice for fieldwork, for safety more than anything else. And one of the things that was in bold was do not be tempted to exceed your stamina in the field, your stamina in the field. Because it is easy to do. Erm the Catch 22 is a little bit is there's an awful lot you'll get from looking at a rock in outcrop, that you could never possibly get from looking at a photograph of that outcrop. So yeah, erm those are my first thoughts.

FFG G: Similarly, if you were doing plant ID or something. Even if you could identify everything by a photo like it is never going to look exactly the same in the field. And there are other clues, that you can use like the smell of the plant or the taste if you are feeling brave. Like it's like, even if you can identify something perfectly by photo, it's never going to be exactly the same in the field.

FFG F: And I was thinking about I had quite a few but one of them was the bonding aspect of it. Because in first year we had a field course, and I just noticed from being on my Zoology course that we had way more connections than some of my friends on other degrees, because we had done that field course. And also, because like having close contact with lecturers so you got to know the lecturers and the PhD students a lot better because you were kind of just living and working with them for like a week. And then more of the kind of because what we do with our fieldwork is we would go out and design an experiment, and then we would have to write up the report in a day and that sort of thing. So having the experience of designing your own experience and going at your own experiment and going out and doing more things. And also like the last one the unexpected nature moments, that you can't really emulate in a digital thing but yeh they're what might just crop up whilst you are looking for stuff.

FFG M: I totally agree with that, and also some people just don't, and I know we've been talking about the accessibility of virtual fieldwork. But actually, some people find the virtual stuff really difficult. Erm and just hard to use and things like that. Erm a lot of people when they're outside they suddenly realise if they're lucky and they get an opportunity to go outside and do proper fieldwork they they suddenly realise, "Omg wow I want to be outside, this is what I want to do. This is the path I want to go on because I feel so at home and this to me is so exciting." And all these different things and all these different animals and plants so whatever it is. Erm and being outside can also make people feel more relaxed and you know just being able to connect with the outdoors and understand actually what it is like. And like you say not being stuck on the screen is really important.

FFG H: It can be inspiring to see what you learn about out physically. Whether you are engaging with it online or not. And also, it's putting what you learn into context like FFG M said. "Oh this is something I've learned about, I'm interested in, I've now seen it in real life, in real life. And yeah, I want to keep going." It kind of entices people in who potentially wouldn't engage or wouldn't go to an environmental science and pursue that in an academic science pathway it's a hands on vocational. They're vocational skills that you develop rather than academic, head in a book.

FFG I: Yeh I would say one of the things that doing it in the classroom are the most boring things to sit and learn about. Talking about quadrats and abundance scales but as soon as you get to do it in the field you're like "This is the best part of this." It's like whereas in the classroom it's the most boring part but in the field it definitely feels like something you actually want to do.

FFG K: Yeah, and I think it is more engaging, you, well I definitely understand stuff better when I'm seeing it in real life rather than on a page. And also, I think being outside if you can get, I don't know about other people. But in a room you can get panicky and not understanding it at all whereas if you're outside, there's fresh air, air around your head. It's just better for your mental health apart from anything else, you feel calmer and you just understand things better. And then going off from that tangentially it is good for people's mental health to be outside and I'm thinking about kind of school, pre-deciding that this is what you want to do. Erm it gives people a love for the outside that they may not otherwise have had the opportunity to really understand and people go on fieldtrips and they don't really, they haven't necessarily been somewhere that remote that not-cityish before. And I know from some of the young people that's really been great for them.

FFG M: Yeah I think that's, you're totally right. Being outside is so good for mental health, especially in the current, the fact that so many people have been isolated and there's so much that people have missed out on. And just the fact that living in cities, most people already feel like they don't get that, and it is so good for your mental health. And I think everyone needs the, gets the experience.

FFG J: I think that, following on from that there is a lot of sort of aspects of nature, subjects that people wouldn't even think about studying, or taking an interest in. If they didn't go out in the field because they just wouldn't otherwise be aware that it existed, and they wouldn't look for it.

FFG K: Yeah, and think being aware of it, then gives you an interest, so even if it's not an interest in specifically, botany or whatever. You can get a wider interest in the climate, maybe it's an interest in geology, kind of wider interests that do shape your life.

FFG G: I think as well it can be, and this is different, but it can be financially beneficial like a lot of the training courses you then have to pay loads for, if you weren't doing them through Uni. Whilst Uni like subsidies them, or provides them for free as well.

FFG F: That's a really good point actually. And I know that when I was at Sussex the Zoology department was constantly fighting with the Uni to not take away the funding for the field courses. So, I guess maybe that would be a slight worry if there was digital fieldwork that became more popular. Unis would go, "This is so much cheaper." So, it's making sure that there is both. Accessibility element of digital fieldwork but it's not like taking away the experience which can be so important. And I guess from an employability point of view as well, I don't know whether there are employers who want to do fieldwork stuff, would prefer students who have had some kind of outdoors experience.

FFG J: I think certainly in Geology, it's pretty much entirely accepted that you haven't really understood the subject unless you have seen it in the field. And it has always been a field-based science. And in terms of cost, when I was at at Bristol, the Head of School and the Management of Earth Sciences were very clear that they should be no fieldwork costs it was part of the response to tuition fees. But it was also because you can't charge someone for what is a very important part of this course. And yes it wasn't easy to provide it for free, there is, I think it needs to be hammered home that in certain subjects you're not really going to understand it unless you see, certain subjects that are, where data has to be have to be collected in the field. You don't really understand the

context of what you are doing and the significance of what you are doing in the lab or in the seminar room or whatever if you've not seen it in the field.

FFG M: Yeah not understanding it's very easy to do some sort of virtual fieldwork and not empathize with and just not even understand what the hell it is even for. Like, "Why are we doing this? What is the importance of you know maintaining this thing?" Err but on two levels. Firstly, not understanding how it actually affects things, and secondly erm if people don't go out into the field, like don't if it's if you're complete detached from it, <yawn> sorry, you're not going to erm care as much. And if you have had that experience, you might, you'll care about insects and things but if not it's so easy to be like "So what? Some insects are dying, I don't really care. If we lose insect species, it doesn't affect me." But if you have gone out and if you've seen like; "That is so cool, wait, what these are dying out, we need to do something, you know."

FFG I: And I think we talked about one of the positives of doing digital stuff was that you could do, like go to different places, like do one in the rainforest. But at the end of the day if you're a student studying in the UK, doing a degree in the UK. Chances are you are going to then work in the UK. So actually, the best fieldwork for you to be doing is stuff that is based in the UK that is actually putting it into context "Oh this is the kind of thing I will be doing." Rather than surveying the rainforest and being like, "How does this apply, to this field in the British countryside."

FFG K: I guess in-person fieldwork also allows you to be able to go back at different times of day different seasons that sort of thing which I've not done online fieldwork but I'd imagine that would be a lot trickier with online fieldwork.

FFG J: And similarly, the other thing that online fieldwork gives you is a false, rather in-person fieldwork would give you a more realistic impression of timescale of going back, having to go back six months later. Rather than you know just jumping forwards 6 months in the space of an instant. Err, the other thing of course, or even longer than that. The other thing of course is experiences, the thing you wouldn't get from online fieldwork is things like working in inclement weather, papers blowing about and other things you will have to contend with if you're out in the field.

FFG F: This might be slightly off topic but related to that, when I was doing my fieldwork in first year in Wales. And we were like out on this estuary and it was like way muddier than I expected so everyone was like sinking all into the mud and people were like trying to pull each other out, like wellies were getting stuck and it was so much fun. But yeah, it is not an experience you would get with digital fieldwork. Which I guess is a positive in some, most ways but also kind of, good memories.

FFG M: That's one of the great things that makes fieldwork so important you know makes you really like and appreciate the outdoors. Erm, I think another thing is that, oh yeah, with virtual fieldwork obviously there's if you're looking at satellite images its slightly different but, a lot of the time if you're looking, if you're researching stuff looking through I don't know, say cameras that have been set up. You're often looking at stuff that people have already looked at and it makes it much harder to actually gather data that we don't already know or do something that actually makes an impact. I remember doing something in Geography erm where we helped in a project where we could, erm where we were, it was some stupid thing, but it meant we were contributing data to a genuine scientific study that they hadn't got and it made me feel like, "Oh my god that's so cool, I've actually helped." Rather than just some stupid piece of Geography homework was actually helping and wasn't just a meaningless task.

FFG F: Yeah, and I guess one other point which maybe fits into the question, yeah it kind of does but probably doing the digital fieldwork stuff is more like processing data rather than collecting it. Which if you are going into a research career that is a lot more realistic to what its likely to be. If you're doing your own fieldwork it will be two weeks in the field and then like a year processing all the data that you've collected so at least it gives you a more realistic expectations of what that career would look like.

FFG J: But on that basis, you could argue to what extent does digital fieldwork, fieldwork at all. In that if you're doing data processing, whilst I would always associate fieldwork with data collection. The process is something you do, data processing has come up a lot in this discussion. But I would always associate data processing with something that you do once when you come back from the field. Not what you do in the field, which is data collection. That's just a thought. And what you would be doing if your really there. Sorry FFG M.

FFG M: I would say in general that can definitely be the case but with the Geography thing we were, erm a camera had been set up err and we were counting how many birds went past the camera and trying to find nice birds. So, it certainly can be data collection as well.

FFG I: Yeah, I think in certain circumstances if you're looking at some satellite imagery then scientists do genuinely just sit and look at satellite imagery in the same way you would if you were doing erm online fieldwork. So, there are certain circumstances that can be emulated quite realistically in digital obviously there are some things that only really work in person so both things do different things I guess.

FFG H: I erm, when we say digital fieldwork, I immediately thought of Citizen Science apps and things like that. And actually when we're talking about it, that's actually like a hybrid because it's obviously in-person data collection from everyone but in a way it's all reliant on this app that everyone has and so it's digital. Because you are there in the field but you're doing your data collection immediately and its immediately added to a wider database. So that's possibly what you did where you're contributing to a database that you can then use.

FFG M: Yeah, it was exactly that sort of thing.

FFG H: But yeah.

FFG M: I guess it, so are we going to be including reliability of data or is this just about fieldwork and virtual fieldwork in terms of what say students can get from it.

Interviewer: Yeah so, we're thinking about it as a teaching and learning exercise ultimately FFG M.

FFG M: Right ok, thanks

Interviewer: So, it'd be nice to hear those who have experience of digital or virtual fieldwork or some technology in field which was what FFG H was saying, using some of those Citizen Science apps. I'm interested to hear your thoughts on using those. So those challenges and opportunities of actually participating in some of these digital fieldwork experiences, that you may have had.

FFG M: For the counting birds thing, it was really user-friendly. It erm it was very easy. And it was, you know it was fun. Erm knowing that you were contributing to something that actually matters.

FFG H: Sometimes there's a, it relies on a higher knowledge on your part. As a general person I wouldn't know which bird is which when it was flying. And so, I couldn't then contribute, whereas as someone who studied and knows their bird species, would, that would be an effective way of

collecting data. But not necessarily all that accessible in a citizen science project. So, I guess it all kind of depends on what you're looking to collect as to what knowledge is needed beforehand for it to be effective.

FFG M: With the bird thing erm very few of the people in my class; most of them were idiot footballers, <laughter> not that I have anything against them. Erm but we did have 15 minute thing something like that, telling us how to identify them and stuff and that was cool learning about that as well. Erm so I think there is a way of making it accessible.

FFG F: I was just thinking that my dissertation might have counted as virtual fieldwork because there was footage that erm another person over the summer had taken of a wood ant nest and then I was like basically collecting, measuring how many times they picked up sticks and stuff. It was to do with co-operative behaviour. Even though I didn't do the original video I was kind of collecting data based on that video. So, I'm not sure if that would count as digital fieldwork but that's definitely from what we were talking about. I was a lot more involved in designing experiments based on that, even though you're not directly there watching the ants yourself.

FFG M: Yeah, it's still that; is that data collection or is that data processing? Because you're like collecting from the collected.

FFG F: Yeah. Definitely felt like collection. The amount of videos I had to watch. Like yeah.

FFG M: You must start seeing ants crawling across your screen.

FFG F: Yeah close your eyes.

FFG M: Oh my god.

FFG J: Philosophically that sounds kind of quite similar to erm people who I know who have studied fossil collections that were sometimes from Museum stores that were sometimes collected decades or centuries ago. Is that data collection or is it data processing. Ofcourse that's not digital its actually being done, working on actual physical specimens in a lab. But philosophically it seems like a similar kind of thing.

FFG G: I think that if your kind of data processing, like getting through data that other people have collected. You don't always, you can't always rely on it, you can't always know that it is right. But if you've collected the data yourself then you can kind of be, "Oh obviously that was when we put that down." But if it is all online, you're not really 100% sure if it's an accident or if that's what actually happened.

FFG M: But I don't think that that's not necessarily, erm maybe there's more instances of that when it's online. But when, erm, I certainly think that there is some of that in-person for example. If you see something you know is that genuinely this type of behavior or was it just my imagination or whatever.

FFG F: I think from what I remember about doing fieldwork I was definitely lots more likely to use slightly incorrect data just because I'm not sure if it's because it's like the end of the day, and you can't find the starfish that you need. And maybe you put down a starfish where there wasn't a starfish. You know, so I'm not more likely to trust data from that.

FFG M: Yeah, so when you're trying to compete with your friends. Who can find the most species and you just say; "Oooh that was an eagle I totally just saw! Oh you just missed it, oh no! Oh well I saw it." Yeah, so there is a lot of that going on.

FFG J: But I think that field fatigue thing would be true whoever has collected the data. You know and that could equally be true for the person who collected the data for the digital session much as it could be for the students themselves. The only difference I could see would be that the person who collected the data, who took the photographs whatever for the digital session, probably had more experience than the student in the digital session.

FFG M: Yeah, which could also mean that they are more experienced bluffers.

FFG F: I was just wondering whether because we are talking about the idea of digital fieldwork as where it is using data that is already collected based in the real world but I don't know if there is anything where it is some kind of virtual reality thing or some kind of game where they have some kind of species like if you're doing a quadrat it can randomly generate that sort of thing. So, it's kind of higher tech, where you are genuinely creating your own data and that's based off computer algorithms or something like that. Because yeah, it being more than just using photographs or videos or whatever.

FFG J: Certainly, immersive digital fieldwork would be a great thing. I'm not sure if technology is up to that sort of thing yet. But it would, it would be a very good thing.

FFG M: Also, would that be more expensive than the actual fieldwork. That might be a problem.

FFG J: But for those people with low mobility.

FFG M: Oh yeah that's a good point.

FFG J: It would be more accessible. Whether those people with low mobility would ever be able to get out in the field for real is another question. On the other hand, it might sort of go some way to solve the problem that I alluded to earlier, that everyone alluded to earlier, out of not really understanding the context of your work in the lab or in the seminar room, or whatever. Erm if you, you haven't seen the field situation, where your data came from. Erm the other thing that occurs to me, just whilst I am thinking about it, is that someone mentioned in some situations if you are working with satellite images which digital fieldwork is essentially what the research is. Well there are some situations where that wouldn't be true. The geologists that study Mars, they haven't been there it's a robot. Erm and you know they study it by the means of a computer. So yeah, you know, that is very true.

Interviewer: Lovely and it has been so nice so far listening in to that really rich discussion. Been really, really wonderful, thank you guys. And also lots of nice personal reflections, and I think that is so important for me to capture and use within my design and evaluation of approaches to make sure they are meeting the needs of people who have recently or who are currently participating in fieldwork through Universities. So, thank you for sharing your thoughts on those questions about challenges and opportunities in in-person fieldwork and also digital fieldwork.

So, I am going to ask you to go back to that initial question we looked at which was thinking about the defining characteristics of digital fieldwork and whether you had, and I am going to share what we have got so far, if you have any additional thoughts that might have cropped up based on our rich discussion that you guys have just been having. So let me just share my screen, I'll get that one up for you. Erm so hopefully you will be able to see those, so I am going to give you a few moments to maybe think about, is there anything new we need to add here? And I'll scroll gently down it as we go. I'll also correct my spelling. If you do have.

FFG G: Oh sorry.

Interviewer: No go ahead FFG G.

FFG G: I don't know if this would fit in the list, but I could suppose you could say it can be like a low-carbon alternative to say, especially abroad experiences.

Interviewer: I'll add that one in thank you. Do just unmute yourself, I'll scroll back up but if you do think there are any other defining characteristics that we should be including in this list for digital fieldwork.

FFG F: I guess one, another one is that you can deliver it to a lot of students at once. Whereas if you were doing in-person fieldwork it's maybe 20 people maximum, so.

FFG J: So, given that you are really going to sitting at your own computer terminal, laptop or whatever. Erm each person will probably essentially be working individually if they are working synchronously even if it is a timetabled session. People are working synchronously and communicating to one and other. But nevertheless, be largely on their own, and any communication will be in-direct compared to working as part of a group in the field.

Interviewer: So, would you be happy FFG J if I put it builds independence, do you think that's a defining characteristic that sums up what you said there?

FFG J: Yes, yes it does.

Interviewer: Lovely, I will add that one on there.

FFG K: Sorry are these all positive?

Interviewer: Not necessarily positive or negative but characteristics of digital fieldwork.

FFG K: Yeah ok, because I was just thinking independence slash it limits team working

Interviewer: Limiting to teamwork or it is digital group work, which is different. So, I will pop that one in there. Yeah.

FFG J: The other thing that occurs to me, is that I think we have alluded to this before but the other characteristic would be that it can only give a rather detailed, a rather limited range of details. It's not within its stroke to give details on every plant community you might see, or every rock outcrop you might see, you know every bird or insect species that you might catch or view. So absolutely it has been curated and of course everyone will always have the same experience. I suppose in the sense that it makes it easier if it is assessed in some way that makes it easy to assess.

Interviewer: Lovely so I have added in there erm those last couple of ones in there. We've added in the low carbon alternative, that we can deliver to a large number of group of students at once, builds independence, that it limits teamwork, slash we have digital group work. And we also have limited range of information, because it is curated by someone, erm and that the digital experience is the same for everyone, so it is an equal experience in that sense.

So, I am going to ask you now to reflect on these, and think about do any of these, can any of these be grouped together, erm can we group some of these ideas that a more similar so to reduce our list down a little bit. Do we need to group any of these, so just shout out and I'll move them as we go, on this document. I will slowly scroll down.

FFG F: I guess the obvious one is we have accessibility on there, I think 3 times so yeah.

Interviewer: Ok yeah, so I'll put, shall I put accessibility all as one. So, you've got accessibility to increase access to fieldwork opportunities, to reduce costs, and where was the third accessibility? Erm especially for those learners with chronic illness as well. Ok so just let me move those all into one.

FFG J: And also, somewhere else in the document we've got you can visit places you wouldn't normally be able to visit, which is probably also arguable part of that point.

Interviewer: Yep, so if we put explore different environments and explore places you wouldn't normally visit, shall I put those together. Is that a yes?

FFG M: Also, the working together thing, like synchronous with Zoom and teamwork, repeatable maybe the in-person, being able to work together, with peers, multiple people.

Interviewer: Ok so let me have a look. See if I can find that, ah so deliver to large numbers of students and that it is limiting teamwork, but it is digital group work. Shall I put those together in that experience of delivering in an online environment.

FFG M: Yeah, there was some more up at the top as well.

Interviewer: Let me move and see, you'll see why in a moment. So, you think with.

FFG M: Synchronous e.g. Zoom

Interviewer: Lovely, I'll pop those to there. Lovely thank you.

FFG J: The other thing that occurs to me is that somewhere there is something on compare and contrast these experiences, which can probably go with explore different environments and explore places you wouldn't normally be able to visit.

Interviewer: Ok.

FFG F: And maybe low-carbon alternative. To go with explore places you wouldn't normally visit.

Interviewer: Ok I will pop that in there for you, thank you to the two of you who have shared that. And I will put that in there. Err ok, ok so I'm going to scroll up, scroll again and do have a look. See if these are looking like there are any more which need to be grouped together.

FFG J: It just occurred to me, that rigid structure and curation, and limited range of details might be two that are quite similar.

Interviewer: Yep, I will put those two together. And I'll scroll again.

FFG G: Erm using secondary data and processing data, put together maybe.

Interviewer: Ok yeah, so we've got ahh yes perfect.

FFG J: Perhaps with modelling and temporal forecasting

Interviewer: Shall I put that one in as well. Is that a consensus? Should we put this one? Yeah.

FFG I: I'd also say like that you can do it in your own time, and the building independence thing would go together as well.

Interviewer: Lovely, thank you. I can't see who is talking but thank you. Erm I am only working on one screen. Sorry guys. It's also blowing a hoolie here in Scotland now, so hopefully you can still hear me. Ok so I will do another scroll.

FFG H: Repeatable and reinforce.

Interviewer: Perfect, thank you.

FFG I: You can probably link those with builds independence, in own time.

Interviewer: Shall I put those in as well?

FFG I: Yeah.

Interviewer: Lovely, thank you. Ok so I'll do a final scroll through, if there's anymore.

FFG J: I wasn't sure. Sorry FFG F.

FFG F: No it's ok, you go.

FFG J: Ok. I wasn't sure whether easier to model data when presented digitally could go with the other group, points where we talked about data modelling.

Interviewer: Yep, I can put that in there.

FFG H: You can also put that making it as much like fieldwork as possible, as giving it context in a situation.

Interviewer: What was that, sorry I missed that because I was just doing the final one. If you could just say those last 2 points sorry.

FFG H: Er giving context and making digital fieldwork the same as fieldwork in-person.

Interviewer: Ahh so put that one with that one. Yep.

FFG H: Yep.

Interviewer: Perfect.

FFG J: There's a couple of places where it occurs to me that broadening horizons could go. One where it is with that one we have just been discussing, and the other is with the accessibility grouping. I'm not sure which the room thinks best.

Interviewer: What do we think. Do you want to keep it as separate opportunity or put it with one of the ones such as exploring different environments?

FFG H: I would say it's more like an accessibility thing. Broadening horizons for everyone.

FFG F: I think it kind of fits in both. Yeh because its broadening horizons if you can't go on fieldwork. But then I guess also the opportunity explore environments like I don't know the Antarctic that you would never do as a fieldtrip. So, I don't know if you can put it both places.

Interviewer: Well shall we leave it separate then, if we think it's something different. That is broadening horizons in various different ways. We can leave it separate, that's absolutely fine.

FFG K: I think that same experience for everyone, equal experience for everyone is about accessibility.

Interviewer: Excellent.

FFG J: Or you could put it with rigidity, and curation. Errm.

FFG K: Fair point.

Interviewer: Ok so we can leave that separate again, that's fine. So, what I am going to do is number these now. Erm, ok. And hopefully you should be able to see them all now on your screen. So, I think you've come up with 12 defining characteristics erm of digital fieldwork there. You've grouped some together, erm what I would like you to do now is this is an individual reflection again now, and I'd like you to think about your top five priorities of defining characteristics. Ok. So erm so really thinking about of these 12, you guys, as a, as a group has come up with. What are your personal top five priorities of the characteristics of digital or virtual fieldwork experiences? And what I would like you to do is. Err and it will be difficult because it'll be Rank 1, that's your top priority. I'd like you to note down the number it was. And Rank 2, so your second priority, pick a number again. And I'd like you to share that, in the chat box because what I am going to be able to do with that. Not live on the Zoom, my maths is not that good. Erm but I will add up and work out as a collective focus group that we have had what were our top 5 priorities, as a group. And I'll be able to share those back with to you via <External person 7> and I'll be interested to gather your thoughts on why you thought that top five was a priority, and what impact those would have. So, right now I would like you to think about your top five ranks. Number 1 is your highest priority defining characteristics, and then group those all together in the chat box and send me one message through, which has got your number one and whatever it was, your number two, which one it is. That would be excellent thank you. Hopefully that makes sense?

FFG F: Do we do which ones should be the priority, if we were focusing on.

Interviewer: Yeah, which is the priorities for you. Which are the top five priorities for you for defining characteristics of digital and virtual fieldwork. Yep. So individually again.

FFG K: My enter is key is completely not working, so can I tell someone else and they can pop them in.

Interviewer: That's fine.

#### <Off topic chatter, as participants share their top five priorities.>

Interviewer: So, I think I've got everyone's through. So, what I will do is over the next couple of days, getting that back out to you as a group your top five priorities. And you will have a chance to reflect on those and share your thoughts back to me, I will put a question in within there for you to populate thinking about was your view represented within the ranked outcomes. Do you agree with the list? Do you disagree? And you'll be able to share your thoughts back with me.

		Rank	Points	Total
1	Home/remote	2	4	4
2	Accessibility to increase access to fieldwork opportunities, reduce costs, such as those learners with chronic illness can access fieldwork with support structures in place.	1, 1, 1, 1, 2, 2	5, 5, 5, 5, 4, 4	28
3	Explore different environments, Explore places that you couldn't normally visit, Expanding on in-person, compare with a different place. Compare and contrast. Low carbon alternative	1, 3, 2, 3, 2, 3, 3	5, 3, 4, 3, 4, 3, 3	24

4	Synchronous e.g. Zoom, Deliver to large number of students at once, Limiting to teamwork/digital group work	5, 3	1, 3	4
5	Using secondary/other people's, authentic data; Processing data rather than collecting data. Has more of a focus/time to do that. Connect process to data. Modelling- temporal variation & forecasting; Easier to model data when presented digitally	3, 3, 5	3, 3, 1	7
6	Repeatable/can look back over; Recorded, revisit fieldwork, reinforce; Builds independence; In own time, asynchronous	4, 4, 5, 4, 5, 4, 4	2, 2, 1, 2, 1, 2, 2	12
7	Emulate in-person fieldwork as much as possible; Giving context/situation	2, 3, 1, 5	4, 3, 5, 1	13
8	Rigid structure/limited responses; Limited range of information, curated by someone			
9	Rigid structure/limited responses; Limited range of information, curated by someone			
10	More tools/software, digital skill development opportunities.	5, 2, 4, 4, 2	1, 4, 2, 2, 4	13
11	Broaden horizons	5, 5, 4	1, 1, 2	4
12	Same experience for everyone, equal experience.	1, 1	5, 5	10

Here are your ranked outcomes for 'What are the defining characteristics of digital fieldwork and how do these enhance existing in-field fieldwork provision?'

1. Accessibility to increase access to fieldwork opportunities; reduce costs; and for those learners with chronic illness who can access fieldwork with existing support structures in place.
2. Explore different environments; explore places that you couldn't normally visit; expanding on in-person fieldwork; compare and contrast with a different place; low carbon alternative to explore these contrasting/different environments.
3. More tools and software use; digital skill development opportunities.
4. (Joint 3<sup>rd</sup>) Emulate in-person fieldwork as much as possible; giving context and situation to the fieldwork.
5. Repeatable; Can look back over; Recorded; Revisit; Reinforce; Builds independence to access fieldwork in own-time asynchronously.