Respondent 22 Interview

Tue, 4/6 9:16AM • 1:06:47

**SUMMARY KEYWORDS**

plant, people, students, module, teach, important, topics, medicinal plant, necessarily, term, biology, function, department, utilize, science, year, question, problem, understand, curriculum

**SPEAKERS**

Respondent 22, Megan Roberts

**Megan Roberts 00:01**

Okay, so I'm just going to ask you a couple of questions. And there's no right or wrong answers already. Just want your opinion. Probably won't take long or 45 minutes.

**Respondent 22 00:14**

Okay, sure.

**Megan Roberts 00:15**

Okay, so my first question to you is, is plant blindness. Okay with that, can you please state your area of expertise and your field of research?

**Respondent 22 00:30**

Alright, so I have a PhD in plant molecular biology, and my area of research is focused on medicinal plant biotechnology. So that pretty much entails doing work that goes from the field and into the lab, we utilize a lot of ecological metabolomics analyses where we look at wild populations and try understand the diversity that's associated with the chemistry. And then often, that metabolomic analyses allows us to be able to then target those particular chemo types for biotechnological applications. And those biotechnological applications may involve blood tissue culture, they may involve genetic transformation and modifications, which ultimately leads us to be able to exploit these different environments to study specialized metabolism. So that's pretty much what it is that we do in our laboratory, we do a lot of phytochemistry we also do a little bit of pharmacology, as a means to better understand whether the environments and conditions that we exploit in vitro are then allowing those plants to express more of the key phytochemicals. And so, we use pharmacological studies to study whether those environments actually have made the extracts more potent from the manipulated plants, whether they're transgenic or non-transgenic. So, in a nutshell, that's kind of like what it is that I do. Okay, and if that's,

**Megan Roberts 02:47**

that sounds very interesting. Okay, so my first question is plant blindness or a lack of interest in plants a problem in your institution. So,

**Respondent 22 03:06**

I am going to refer to this as plant awareness disparity because some people in you know, don't like the word, the blindness that's associated with this, because it, you know, kind of like infers to a disability. And so, there's been a movement to actually call it plant awareness disparity. That seems a little bit camouflaged in terms of what it is, but it's more of a, it's that particular term is becoming more of a term that's more socially and culturally acceptable. So, I'll call it plant awareness, disparity and maybe moving forward as well, you can maybe start utilizing that particular term. So, um, so I teach it first year level, and I teach a course in plant biology and the group of students that I have in that particular first year course, come from all different faculties and even walks of life. And there's usually a negative attitude towards studying plant biology, especially for students who might have an interest in Sport Science, for example, or human physiology, or even Animal Sciences. They often don't understand why they have to then have a module that's associated with plant biology and plant form and function, which is the course that we teach at the first-year level. So yes, there is some form of plant awareness disparity, where people are not really aware of the role of plants in their day to day lives. And this is not necessarily associated with a first-year student alone. But socially, many different people actually don't understand the fact that plants are important for nutrition, they are important for building structures. So, you know, building roofs over our heads, you know, we live in the Western Cape, where even thatching actually comes from restios, which happened to be plants and desks that we are utilizing are made out of wood. So, plants are actually integral in our day-to-day living, and from clothing dyes that are utilized to make our clothes and all kinds of interactions that we have with plants on a day-to-day basis, often, people are not necessarily aware of them. And so yes, there is a problem with plant awareness disparity. And we need to be able to dispel this and make you know, first year students and other communities as a whole have the role of plants in their day to day lives. And I'm interested in medicinal plants, and how people interact with medicinal plants. And so, one way that you can actually, you know, try and make different people and, and different societies actually aware of the importance of plants is the fact that at least 25% of all our pharmaceutical drugs are derived from plants, whether they are synthetics, that are in in the pharmaceutical space, semi synthetics, or even, you know, plant chemicals, like Texel, which are actually derived directly from plants. So, I know, that was a little bit detailed, but I thought it would be important just to take it, you know, from a basic answer actually provide the information of why I think it's important for people to be aware of plants and their role in our day-to-day living. Does it work for you?

**Megan Roberts 07:57**

Yes, that was perfect. Thank you, the more you say the more information I have to work with. So that's perfect. Thank you for the plant security awareness term, I do know about it. And I am using it in my writing up. I've found that more people are more familiar with the term plant blindness, which is why for the sake of interviews, I'm using the old term descriptors people more people are more familiar with it, then return. Okay, do you have a potential reason? Or do you have a reason as to why you think plant disparity awareness is a problem, or there is this lack of interest just generally in plants?

**Respondent 22 08:48**

I do have some hypotheses on why I think this may be so one of them is, you know, it's a basic I suppose, animal instinct, we happen to be animals. And so somehow, we as animals are probably more drawn to animals, you know, we think animals are cute and cuddly and, and from very young ages. We are introduced to animals as pets in our homes. And so, we are much more aware of how animals can provide us with a with psychological relief from stress, for example, but we are not necessarily aware of the fact that as humans and animals we are actually drawn to plants and they provide similar psychological relief and actually seeing green which is why people often go out into nature, seeing green smelling plants, having flowers inside the home. And, and interacting actually with plants gives us a psychological relief. You know, those plant chemicals actually bind to your central nervous system and they interact with your gamma receptors. And so, when you go on a hike and you are in the forest, and you are in nature and you're surrounded by plants, that actually gives you some kind of neuro psychological relief. And plants are even very important for our healing when we're actually feeling from medical treatments and even surgery, for example. But most people are not necessarily aware of this. Because we don't necessarily visualize plants in the same way as being fluffy and cuddly. That's one reason for plant awareness disparity. Secondly, it's associated with, or it's likely associated with the way in which plant biology and plant sciences are actually taught at school, they form a minor component of the curriculum. And that, again, I think, is driven by the fact that we think that, you know, animals are so important just because we happen to be animals. So, they've formed a minor component of the curriculum. And, and often, it's not necessarily taught to the same quality as the animal sciences. So, there's usually more presentation of animal science in a school curriculum right up until matric and in some instances, plant physiology, for example, students will have an introduction to this in grade 10, and then they never really get to hear about it again. And that I think, is problematic. And, and so, and often the people that are actually teaching the plant science in school, you know, that the educators and the teachers, they themselves are not necessarily that well educated, or even that aware of different scientific inventions and discoveries that are actually associated with plant science. Last but not least, there's just not enough about Plant Sciences, in our day-to-day interactions, even in the media, whether it be from print media, to television, to social media, is just not enough. And, and so some of those reasons, I think, continue to, you know, create bias around the plant sciences, often students will say that plants are boring. And that comes from somewhere. When I started teaching them all, we had to learn about plants. But plants are so boring. And they often don't realize that plants are actually really exciting. And we don't even know enough about how they work. And that you get plants that live in all kinds of environments. And we don't even know how they managed to do this from the desert. Water, sea. Pretty much any environment on Earth has probably got plant life. And we as animals are restricted in terms of where we can actually live, even though we are so mobile. And so often, they just don't have an understanding of why it's important to study plants. And then they also come from a background or environment where plants have been taught to really badly and even home environments where there's not enough appreciation of the importance of plants in their day to day lives. already does that work?

**Megan Roberts 15:04**

Yes, thank you. That is a wonderful answer. Um, okay, my next question, do you have issues getting students to enroll for your plant science degrees.

**Respondent 22 15:17**

So initially, we don't necessarily, we don't have a, you know, in my department with the Department of botany and zoology. And so, it's actually an integrated course, where you have both plants and animals being taught and how they interact. Because it's, you know, it's a community of interactions. So, there isn't a standalone botany course. And we don't have like a standalone Plant Sciences Department. Even though they are not modules that are incorporated into our program that are standalone and everybody whether they do plants or animals, they've got to take them at the undergraduate level. That is our particular department. at a university wide scale, you have horticulture with plants, obviously, plant sciences will be taught, you have wine biotechnology and wine sciences, wine makers need to know how grapes work and grapes happen to be plants. And then you'll have you know, presentation of plant biology in different agricultural modules, plant Path, you got to know how plants are working because they respond to pathogens that attack them. For example, we also have the Institute of plant biotechnology that presents a lot of plant-based modules. And that module is taught in the cellular and molecular biology streams. And so, chemists are also presented with different modules that are associated with plant natural products. So, there isn't one place where you can just learn about plants. Yes, so you have students that will interact with Plant Sciences in different modules, and different programs. For example, at some stage, we were even teaching medicinal plants to the medical students, because their patients will probably interact with, with, you know, traditional healers that might administer traditional plant medicines. And so, they need to be aware of that as well, even to the occupational therapists who were actually given a module on medicinal plants and medicinal plant chemistry. However, having said all of this, that there isn't one a one stop place where you can take a plant-based module or program. At the first level, students are exposed to everything. And often they change their initial choice of modules, after they've had some plant ecology, plant evolution. plant physiology plant form and function, they start to actually realize that, gee, this is interesting. And we have never, you know, it, sometimes it's the first interaction, they are learning about very interesting concepts that are associated with Plant Sciences. And then it’s kind of like starts to turn them on. And we also have a really dynamic group of lecturers that actually present this, these different modules, and they are experts in in their own rights. And I think that passion, and, you know, curiosity that's actually owned by the different lecturers in terms of their particular disciplines, starts to actually inspire inspired different students. And often, you end up with students who then change their original choice, and then they're like, oh, plants are cool, I want to study this. I want to learn more about this. And then they end up in our particular program. And they would have shifted say from doing the molecular and cell and then they go into biodiversity and ecology. So, you have instances where students do change, and change their minds, even though it wasn't necessarily the first choice. I don't know if I've given you enough date, but let me know if there's something else that you want to talk about. With respect to that. Um,

**Megan Roberts 20:09**

I think so. So, the way that you guys work is obviously quite different in the way we do it. Um, at any point in time, do students have the opportunity to inexorably take any of your palm sized modules like this, specifically plant-based ones.

**Respondent 22 20:30**

So, you know, the program is, is quite integrated so. So, you have students from other parts of the, of, you know, from other universities, from other departments, that can actually pick up our modules. So, we've had psychologists that come and pick up a module in plant physiology, we've had, you know, students that want to maybe go into biological teaching, that are doing education that might come and pick this up, we've herpetologist, who have come from other places in the world that come and pick up courses and, you know, students that might even be at other universities that have come for a, a, you know, a term or study abroad, that pick up a module. So, it's not like we, we not allowing students to take the module if they're not in our particular stream. And at the same time, the biodiversity and ecology degree, which is pretty much what is offered by us, has got different components. And if you are in that particular stream, and also conservation ecology that actually fits in another department, you don't necessarily have a lot of electives, the electives happen to be genetics, and biochemistry. And you actually have to do these, these are our courses in order to be able to get your degree. And this can be climate change, it can be evolution and genetics, so if you're doing a BDE, you are going to interact with some plant-based module at some stage. But if you're coming from other departments, you will then be able to pick up our courses should you wish we are having a recalculation of this degree. And that's happening on the 22nd of April, but at the moment, that's how it stands. We also have been in a discussion with the chemists and biochemists and the human physiologist to actually start offering a truly human physiology program, a degree where, I suppose it would be a little bit more like the you know, the up kind of like fighter medicines degree. But, and the reason for this is because there's a lot of interest from students who want to do either medicinal plant chemistry or they want to go into drug discovery, or who are doing physiology and are working on natural products and you know, linked with central nervous system activity or cancer, you know, disease management and these kinds of things. So, we are, we have been in conversation about actually offering to those types of students a degree where they can actually pick their courses and combine this into a module or into a degree that will then give them some kind of human physiology with a bit of plant biology and medicinal plant chemistry. So that in the making.

**Megan Roberts 24:23**

Okay, thank you. Um, my next question, do you think a first-year plant science module should have a narrow approach that covers a few concepts in detail, or a broad approach that touches on multiple concepts and disciplines within the field?

**Respondent 22 24:42**

I think it depends what you're offering. So, you know, I did botany when I was in first year in 1990, which is a long time ago, and I did Zoology and I had to old you know, semesters of plant biology, and it literally went from microscopy to field work, you know, it was different topics that were being presented all the way through. And that was actually quite broad, but in some instances deep. So, we might have maybe gone a little bit shallow with, you know, with, you know, just plant evolution, but then, at the same time, you would go very deep in terms of looking at how plants moved from water to land. So, so I just think it depends on, on who you are presenting this to, and what the next tier of their degree is going to be. So, if you're going to be talking to somebody or, or, you know, constructing that course, for somebody that's going to ultimately become a botanist, then I think you've got to lay a very good foundation, and certain topics need to be interrogated in you know, quite specifically and in depth, especially if they're never going to be presented again, upstream in the degree. Okay, so, so that that's one way of doing it. But at the same time, if you are presenting this, say to somebody who might then go off and do a degree in cell and molecular biology, that then targets at a totally different space, it may be of interest to, to touch on topics, which might be exciting, or trendy, for example, just to maybe inspire those people and present something that's a little bit sexy. And there are certain topics, which I think facilitate this, and then some topics don't necessarily, you know, encourage a lot of this. I mean, often, you know, students have this idea that botanists are just staring at microscopes and looking at cells the whole entire day. And this is what people do. But they don't realize that botanists have got so many diverse ways in which they actually study plants, and that there's different types of, of plant scientists, for example. And, you know, it goes from people that are studying plant animal interactions that are looking at pollination biology, to people that might be looking at the diatoms that are, you know, and algae and marine biology and sea grasses and mangroves. So, there's a real diversity of people. But often, I think at the first-year level, students are not necessarily aware of this. So, what we present different pockets of information. So, in our module, we present what we call plant form and function. So, they look at the form so they look at anatomy, but they look at it from a functional perspective. Plants are constructed in a particular way, because this allows them to be able to function and actually be able to adapt and adapt to the environment. So, they might learn about the chloroplasts. So, they know what the chloroplasts’ structure looks like. But then they need to understand that that structure actually allows for plants to be able to turn light energy into chemical energy. So, then we overlay the function. And some of those topics would go really deep into them, and especially topics which we know are not necessarily taught well at school. And so, we try to correct some of these, you know, education, educational glitches. And often, you know, students really start presenting on topics related to photosynthesis. They think like, oh, there's everything to know about photosynthesis. Like, why are people even still studying this, failing to understand that this is a highly complicated and highly sophisticated process. And there's still new things that we are learning about. And I'm just going to give you an example here, because I think often it's really important to go deep on particular topics. But that doesn't mean that you should go deep about everything, because the first-year curriculum does not necessarily allow this. So, I think you've got to be strategic about the topics where you go deep, and some of those topics that you might be a little bit shallow, where you just give a taste, and you know that you're going to layer those in, in other years for students who are going to carry on with the plant-based stream. So, a few years ago, I posted something on my Facebook and I was teaching, you know, first year, first years at the time, and we talked about photosynthesis. And then a friend of mine who actually has a PhD in plant biology, but she's not a researcher, she just went to teaching was like, oh, she doesn't understand why I'm still using this particular term. Because at in their IEB curriculum, they've been forced to use this other term. And, you know, they've drove their students to use this particular term. And I actually have to answer to this. Because I think this does create problems. Science is a continuous, it's continuous and dynamic, it is not static. And there are new discoveries that are taking place all the time. And researchers may utilize a diversity of language, because a diverse range of terms. And that is because we are continuously learning and discovering new things. And I had a real problem with this, you can only call this particular enzyme in this way. Because even that enzyme that actually, you know, is important in photosynthesis, we don't know everything about how it actually works. And when you actually start looking at the literature, people are using all kinds of different terms. So now, when at the school level, they say you can only use this term, it becomes problematic, because it says you can only visualize this problem in one particular way. And that creates tunnel vision, which is not the way that scientists are actually trained to be able to function. We need to be able to see problems from different dimensions. And so, you know, I ended up even sending out some papers, the most current literature to kind of encourage a little bit of conversation around this topic, but I think it is important sometimes to go deep. And to present the most current literature, even at the first gen level, so that people don't realize, you know, students realize that topics that they think, you know, are done and dusted. You know, that problem was long sorted out in the 1960s. They actually need to realize that we are still learning so much actually about those particular topics, even to date, utilizing our most advanced tools. Okay.

**Megan Roberts 34:18**

Okay, so, for question four. I don't know if you have the interview guide in front of you. Okay, I have posted in the chatroom.

**Respondent 22 34:33**

You posted it in the chat or you send it to me, but

**Megan Roberts 34:37**

I cannot come up. Okay, there we go. Okay, so all these concepts, they're very broad, sort of like umbrella concepts. There's five of them. Which two of those do you think are most important? To teach on a first-year level.

**Respondent 22 35:04**

Okay, so out of those concepts, evolution pathways, transformation of energy and matter. Yeah. information flow exchange and storage structure and function systems.

**Megan Roberts 35:16**

So, which of those do you think?

**Respondent 22 35:19**

I mean, I think it's very difficult to choose topics, just based on exactly what I just previously said. Yeah, it depends where people are going. I mean, I think ignition is very important. And so, for examples, I mean, we have presumably, say pathways, transformations of energy and matter, that kind of like biochemistry, right? Yeah. So, I mean, and some of these things, I would actually bundle together, for example. Right. So, I would I mean, I'm not sure what you mean by systems is that like ecological systems? Yeah. So, I, I would put evolution and ecological systems together as a topic, for example. And then some of those things stick together. So, like the structure and function, I would then utilize B, and C, and incorporate those two, so that you may actually be touching on all of these different things. But not necessarily flowing in very deep with every topic. But, you know, laying the foundation, and maybe using one or two of those topics, to then give a lot more insight into a particular problem. Does that kind of… so instead of having like a list, that I'm kind of using a bit of an integrated approach, yeah? And then you take them, maybe specific topics that you then delve into, a little bit deeper. So, for example, I'm just going to go back to the structure and function in pathways, transformations and energy and matter you can do the structure and function similarly to my example that I used with regards to photosynthesis. So now, I'm going to use a different example. So now we're talking about mitochondria, mitochondrial function, right? And then you can then give a little bit of the structure and the function of the mitochondria and then the pathways that are actually associated with oxidative phosphorylation relation. So instead of teaching each of those things, singularly, you actually put them together, so that it becomes a functional unit, rather than we just looking at the pathway of what this thing of what this biochemical pathway does. Because that biochemical pathway is not working alone as an entity, they have to be structures of organellar structures and actually facilitate the way in which that pathway functions. And then I think in the second year, the students going to go off to biochemistry, then, you know, they can go back and look more deeply into the enzymes and whatnot.

**Megan Roberts 39:17**

Okay. And that brings me to my next question, which is very similar. So, I'm also going to post the options in the chat of these lists of skills or competencies. Which of these your top two that you could think or say, are most important for a first year to grasp? Moving out, not just whether it's Plant Sciences but out into various different these terms of science, which of those do you think would be most important to try and really instill in them and get them to grasp really well.

**Respondent 22 40:15**

Okay, so, I mean, I'm looking at this, and again, I'm kind of thinking you could actually embed these amongst the first two processes. So, the process of science, the interest in interdisciplinary nature of science, you can actually bring in some of these some of these topics, because the process of science involves some of those things that are actually lower down. Right, yeah it involves communication, collaboration, understanding and being able to interpret data, quantitative competency, etc. So, again, the interdisciplinary nature of science, also, again, touches on you know, integration of science with society, etc., etc. So, I would say, like, you could use this the process of science and the interdisciplinary nature of science, to be able to pull up C, D, E, F, and G. And we kind of do, you know, some of these things anyways, you know, students are asked to, you know, do practicals, they get a set of results, and then they've got to, you know, go for it, and interpret those results. And it may involve a quantitative analyses, you know, and utilizing maybe even courses that are not necessarily given directly in our, in our program, you know, they do some communication and writing skills, and, but it's offered elsewhere, it's another course, they touch on statistics, and then they then have to be able to use those tools within our courses, even at the first year level, they are given, they generate their own data, where they have to then be able to interpret results and be able to understand results, and, you know, giving the process, actually, practically instilling how you actually do science, you know, you got to be curious. And curiosity sparks questions, those questions allow you to be able to design experiments, experiments, that allow you to be able to test these different hypotheses that you might have constructed at the, you know, after you've been thinking about the questions, and then how do you then utilize the data to be able to validate? And, you know, confirm, or, you know, kind of, or not confirm your hypothesis? Yeah.

**Megan Roberts 43:42**

So, is there any of those that you think could maybe be left to secondary level? Or is, do you think it's all important to be touched on, in some way or form in the first-year level, I think the way that you sort of described it to me, I really like because of the fact that you include all of them, but you do it in such a way that it's not necessarily something that you're going to have to like, take time specifically to touch on, but rather something that you're doing almost inadvertently.

**Respondent 22 44:22**

Yes, absolutely. It's actually learning. I mean, a lot of those some of those things are actually soft skills. That it's not like, yes, you can learn about communication and, but, you know, you can give some guidance on how to write a good essay. And then you go, okay, this is your topic. of you go now practice,

**Megan Roberts 44:47**

yeah.

**Respondent 22 44:48**

But then, as you carry on, up the ladder, you know, even at honors level, all of those processes, all of those, you know, topics are still interrogated? Yeah, because this is a continuum. It's not like, we've given you everything that you need. Cheer’s bye. Yeah. You know, it's a continuum, you actually almost see it, you know, as you lay the foundation, and then you build a house, yeah. And then you might decide, oh, I only built a one story in first year. Or in second year, now, I've got to the one store, but hey, I want to build a deck. And then you add on the next one. So, so it is continuous. And, and, you know, you know, there's, sometimes I think these things actually go in trades at the moment, like science communication is, is so important. And so even in our, in our say, like honors modules, we actually bring in science communicators and say, hey, we need to learn when we've spent a lot of time teaching people how to write scientific papers, how do you turn your scientific paper into something that's a little bit more palatable? We might not have done that in previous years, because that is another way of communicating. So, in my third-year module last year, I made my students do a podcast, but in first year, I don't necessarily make them do podcasts. You know, it’s more foundational skills, you know, how do you actually answer an essay question at a university level? You know, if you say that plants make food, what is that? I don't really understand that. And, you know, you need to be able to use the scientific language. They make lipids, carbohydrates, and proteins and, you know, make food. It's so you know, that statement doesn't say anything. And, and, and often I think students come with these kinds of poor communication skills. And then you need to start layering, you know, better communication. And then, but you need to continue with it. As part of your process.

**Megan Roberts 47:43**

Yeah. Okay, my next question. What do you think the barriers to changing a first-year curriculum will be? Whoa,

**Respondent 22 47:57**

The barriers to changing a first-year curriculum are often associated with inter and intra institutional constraints. So, for example, if we change our first year, curriculum, we've actually got to make everyone else aware of, of what it is that we've done, because there are people in other departments that are expecting us to touch on particular topics. Yeah. And so, it, it will have an influence on them. And then, sometimes these things are historical, so they might be in a departmental where, you know, you might be wanting to teach on a hot an exciting new topic. That is, like, on trend and older staff are like, hey, you can't teach this. If you don't have that, you know, that you've got to have basic, you know, the basic biology, but they need to know what a style looks like, you know, before you can leap into cytochrome function in p450 enzymes kind of thing. So, you know, that, so that they can be intra institutional constraints and even interdepartmental constraints. Also, you know, when you are changing a curriculum, you need to be aware of, of whether this is going to be of the right standard, you know, locally and internationally. The Department of Higher Education also has its you know, its standards, you know, there’s a lot of flexibility in what you can teach, but at the same time, you have to also uphold particular standards, so, so that and often, you know, a first year, biology courses are supposed to have certain things these things that are kind of like cast in stone, that you, you've got to do this, you know, if you don't see you're not teaching plant biology. So, I even think perception can be a constraint. Yeah. And I think that those are the ones I'll bring up. Yeah.

**Megan Roberts 50:48**

suggestions as to how we might be able to overcome those?

**Respondent 22 50:54**

Well, gosh, um, I think it's important to be able to see, you know, just better understand your own micro environment, you know, and, and then also, you know, outside of your own environment, so what I think you guys are doing is great. And you go out there, you ask people their opinions, you see what things are, and then you go back, and you distill it, and then re constructed. So, um, what we have been doing is, we occasionally, look at ours, you know, every five years or something like this, and then we, we actually have a workshop, like I said, where we all talk to each other within the department. And then, you know, and include topics that are really important. When I arrived here at Stellenbosch University in 2005. There wasn't much in terms of climate change biology. But now, you know, that topic is very much well interrogated in our department, because we also happen to have a climate change scientist, that's in the department, I think, also, the way in which these things flow as well. Also depends on who is in the staff. Yeah, you know, you may find that you may be teaching a lot related to plant medicines, and you're laying a foundation for students that are going to flow into that particular program, just because you have a very strong phytomedicines group, for example. Yeah, so I think does it that it, it can that can influence things at UCT that biology plant biology programs, there's a lot of disciplines that kind of goes into their first-year modules, but you see a little bit of, of ecology as well, because they're very strong in terms of plant ecology and cape flora biology. So, I think that can have an influence, but the way that we do it, and I don't necessarily think this is the only way to do it, I'm really liking your process here. We have everyone in the department, we go somewhere and sit at a wine farm somewhere to talk to each other, we workshop it and sometimes we have facilitators there who are not necessarily scientists who facilitate that process, because there can, it can be quite vigorous and rowdy, and people have got strong opinions. And so sometimes we have, you know, facilitators just to manage that process. And we also think about who is it that we want to produce at the end of the day? You know, what is our product if we don't know where we going, you can't have a plan. And so, we need to be able to understand our destination, so that we can then get prepared. And I say this because, you know, if you're going to be heading off from Cape Town to Joburg, you need to know which route you're going to take where your stops are going to be. Are you going to take padkos or not, you know, so what's going to be in that padkos it will it be enough to sustain you all the way to Joburg Are you going to stop along the way and purchase something so we need to have a plan? So, we do think about our destination, and the student that is going to be a product, we are a very much a research driven department. And so, our product needs to be able to, often needs to be and you know, we don't hide this research driven in your environment. So, we are in very many ways, setting that foundation for people to be able to be successful in a research environment post, the undergraduate degree. You know, even Now, having said that, we also realize that our students don't necessarily all become researchers and academics. So, they fit into all kinds of different job spaces. So, we also instill them with a lot of critical skills and mega cognitive skills and a lot of soft skills that can actually empower them to be able to cope in any environment. And it's not necessarily about getting a degree in plant science that actually has a name, but rather about, you know, these soft skills or problem-solving skills, or critical thinking. And these are, you know, skills that we actually teach and embed into our program, you know, that we incorporate into our program that are not necessarily hot, and you know, fast, but you can, you can see, the students are able to, to enter into all kinds of spaces. I mean, we have students who have gone into journalism, for example, we've, you know, one of my honors students that was at undergraduate level, she's now in marketing in a digital company. So, she's using her science degree in a very different way, from some of the students that are doing their PhDs but still able to highly function in society.

**Megan Roberts 57:44**

Yeah, definitely. That's, that's really cool. Um, okay, um, I see we are running out of time, just a little. So, I have three questions left for you. The first one is, what kind of resistance Do you foresee what lecturers specifically have with a change in a plant science module?

**Respondent 22 58:11**

With lecturers?

**Megan Roberts 58:12**

Yeah. So, what kind of issues do you think they would have with the idea of changing a module?

**Respondent 22 58:21**

Well, if the module changes without their participation, that I think is problematic. Yeah. Because, quite honestly, I don't like being told what to teach, and how to teach it. Yeah, I have extreme resistance to that. Like, you can't come and like, enforce things on me. Because it has to still deliver that material, make it exciting. And, and I've got to be excited by it. When I'm prepping that like that class. So, I think it has to be participatory. So, changing modules needs to be participatory. It can't just come like top down. Like he says, oh, no, today, as of tomorrow, you're going to teach evolution? I don't think so. Yeah. Right. I need to be the one saying, oh, I can't wait to teach a course on plant evolution. So, I think they have it has to be participatory, it can't just be some kind of dictatorship, where somebody makes decisions and then people get told what to do.

**Megan Roberts 59:34**

Yeah. Yeah.

**Respondent 22 59:37**

So, there would be a lot of resistance if lectures are just been told. They have to be part of the process. You've got to be part of the calculation. And I think often people might be.... this takes time. It doesn't happen overnight. Right. So, there might be as well, because people are thinking my I have all of my lecture notes that I've been that I made up in 2005. And I don't understand why I can still use them in 2021. Now. Yeah. I think might be some issues that I that I foresee. Yeah. And changes, name. Change is hard for people. We like our comfort zone. So even as scientists, even though we, we should be more adaptable to change, but yeah.

**Megan Roberts 1:00:40**

Okay, and then what could potentially be a good selling angle for us to motivate people to be willing to take part in the change process? Okay, that's a hard one.

**Respondent 22 1:01:01**

I mean, I think one of I often think that when one is going through this, this process of changing a module, what is one also actually learned a lot? Yeah, I think sometimes, we just don't have the time to sit and just appreciate new developments in the literature and new ways of actually doing things. So that might be that might, that might be one way in which to, you know, to do that, to attract lecturers to change your curriculum. And even just making them aware of that the student body itself is continuously changing. And so, it can't be delivered in the way that it was done when my father was at university in the 1950s, for example, in plant science, you know, and so they need to be aware of the fact that you have a new set of people who are, you know, who actually vision visualize the world in a slightly different way? Yeah. And so that one is one way of also going, it's important to change, the world is changing. So then why are you not wanting to change? Otherwise, you don't change you get left behind. So, to be globally competitive, it's important.

**Megan Roberts 1:02:43**

Okay, then my last question for you, is a relatively easy question. How important are hands on practicals for a first-year plant science module?

**Respondent 22 1:02:57**

Okay, it's tough at the moment, just because of the pandemic. But I don't know how you can do first year without having a practical aspect to what you are teaching. Yeah. Because for me, the practical is not like something that's just put on there as, like, I've got nothing else to do on a Tuesday afternoon for three hours. And often, I think sometimes students see it like this. Yeah. But to me, is there to reinforce what I deliver that in the class, we, you know, part of your learning is to actually stimulate every one of your senses. That is how we learn. Right? Yeah, you've got to tap. You got to feel it, you've got to see it. And different people understand different concepts in different ways. And so, the practical aspect is there as an integral part of what it is that is covered in the theory. I don't have any practical that's just like a tag along. Every single practical that we offer, is well thought up to re-instill theoretical concepts that sometimes are very difficult for some people who can't visualize things. And when they see it, or do it, it just puts on lightbulbs. Yeah, for some, for some people. It's very I don't think you can do first year Without practicals we have gone even with digital projects, you know, digital experiments, you can do this, but they still some practical aspect. And then all those other things that you're talking about, you need to be able to buy the pack. Those practices, the communication, the collaboration, because these are some of the things that you do in the practice. Some of them are done, literally, some of them are done together with your teammates, the understanding of interpretation, that stuff is important, and it's integrated into the now.

**Megan Roberts 1:05:41**

Okay. That is all from my side. In terms of my questions. It has been so wonderful talking to you, you have given me so much information and so beautiful. Thank you so much. Do you have any questions for me or anything that you'd like to add?

**Respondent 22 1:06:01**

Um, no, not necessarily. So, after this, what's happening, you interviewing all kinds of other people I presume? And then what happens after

**Megan Roberts 1:06:10**

so, I'm domestically analyzing the data. So, all the information that everyone gives me, I'm going to then turn it to numerical data. And then what's going to happen is that is going to then become a second questionnaire. So just the things that I don't have consensus on from everyone will then go out to everyone again, there'll be a quick just do online, fill in with the scale or multiple choice, something like that for everyone to just quickly fill in and then that'll be that.

**Respondent 22 1:06:42**

Okay, sounds good. Yeah, all the best and this