Respondent 18 Interview

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**SUMMARY KEYWORDS**

module, plant, botany, concepts, people, introduced, terms, year, bit, students, structure, science, person, important, function, practical, question, update, implement, teaching

**SPEAKERS**

Megan Roberts, Respondent 18

**Megan Roberts 00:00**

Thank you. Right? Um, okay, so I'm just going to ask you a couple of questions, and we can have a bit of a discussion about them, and then that'll be that.

**Respondent 18 00:13**

Okay.

**Megan Roberts 00:14**

Okay, can you please start by stating your area of expertise.

**Respondent 18 00:22**

I'm a botanist at the University of Johannesburg. I focused on pre harvest and post-harvest plant physiology. My research areas are mainly within nutritional characterization of plants to find new food ingredients, and then going on to look at pre harvest protocols for improving nutritional quality during growth, and also trying to develop some protocols for maintaining quality after harvest.

**Megan Roberts 00:59**

Thank you. So, my first question to you is, is plant blindness or a lack of interest in plants a problem in your institution.

**Respondent 18 01:14**

It is in terms of recruitments. And also, in terms of awareness of students and what botany entails, Plant Sciences entail and how easily that applies to daily life. And how important it is to the functioning of society. I think it's a problem. When people come in on the first day, you often have to go in extra and put in an extra effort just to get them interested in seeing the point to why they are learning what they are learning.

**Megan Roberts 01:59**

Okay. My next question, do you have issues getting students to enroll for your plant science degrees?

**Respondent 18 02:10**

Yes, I've, I've had an engagement with them at second year level. And this is where they get to choose which modules they will do for the rest of the degrees. And for us, they choose between specializing a little bit more on botany or just going the zoology route. And I must admit, because of the reputation that zoology tends to have, and maybe the plant sciences falling behind and coming to the limelight, they do tend to choose zoology more than they choose us. So yeah, this often reflects as they move on to other programs like third year also with the intake, or applicants, number of applicants that we have at honors.

**Megan Roberts 03:06**

do you have a potential reason as to why they would rather study Zoology over plant science?

**Respondent 18 03:17**

I don't know what my colleagues would say. But I think it's mainly has to do with awareness and applicability to just daily life. I think botany and plant science specifically is one of those areas that might easily be taken for granted, because you just think plants are always there when you need them, whether you're using them for medicinal purposes or using them for food. So, it does take a bit of just talking through things with the person with students to make them aware of important it is to actually have people working within the plant sciences and therefore getting them to see them as a career path that they could choose.

**Megan Roberts 04:14**

All right, my next question do you think a first-year plant science module should have a narrow approach covering a few concepts in detail, or a broad approach touching on multiple concepts within the field?

**Respondent 18 04:33**

Megan, is it an either-or type of question, or can I just comment a bit to open it up? Because I do think a narrow approach is absolutely necessary, but with a bit of inclusion on the broad approach. The narrow approach allows them to grasp concepts, basic concepts within the Plant Sciences, whether it's with plant function, structure, molecular makeup, systematics, they need the basic principles sort of, to be explained to them for them to be exposed, so that they understand anything that follows afterwards. Those are just basic principles for plant science. But to open up the mind and make an individual, aware of how applicable the information is, there has to be an integration of the broad approach as well. Where you talk about how the basic makeup of a plant would relate to the function, what they see in terms of evolution of plants, what they see in terms of evolution of how we use the plants, for food, for medicine, whatever, even structural functions that we have within society as building material, there needs to be a bit of both, maybe stronger on the narrow approach because at that point, you just need those basic principles instilled. But also, for them to know how this then applies to just add a product concept.

**Megan Roberts 06:28**

Okay.

**Respondent 18 06:30**

I'm not sure if I was allowed to do that. Or you expected me to choose just one.

**Megan Roberts 06:36**

Now you are allowed to, I'm looking for your opinion. So yeah, whatever your opinion is, you can't have a wrong one.

**Respondent 18 06:45**

Okay. Like, if you had to think as an individual yourself, you wouldn't like to just know how a plant is important and how it functions, any particular plant, you later would like to know what they relate to, what the relationship between that plant and maybe mathematics might be, how would it be useful in mathematics? How could it be used by chemists, for instance, because eventually, when we go out into our careers, which we hope that everyone who enrolls at first year, second year level, would hope to do, eventually, they'd have to use that information to try and solve real life problems, which would require actually a multidisciplinary approach to things and also thinking of different concepts. So, you don't want to close them off by just them thinking of plants as a separate concept. And then they walk away thinking, oh, that module, I do find this, that a person would walk away by the time you meet them at second year, third year, they just refer to it as that module, they have absolutely no grasp of how it links to the different components of what they've learned in other modules and what they continue to learn.

**Megan Roberts 08:19**

Okay, my next question, or which of the following concepts Do you think should be incorporated in a first-year plant science model, evolution, pathways and transformations of energy and matter, information flow, exchange and storage, structure and function, and systems?

**Respondent 18 08:54**

All of them, but not to the same degree? Because you can only fit so much. Um, maybe before I go on too much. How do you structure your first-year module is the general semester model that you follow or you've got annual programs?

**Megan Roberts 09:15**

So, our plant science module runs in the second semester, and its specifically just plants. In the first semester, we have a sort of general biology module that covers genetics, photosynthesis sells basic cell biology, some cell biochemistry. And then in second semester, we have a module specifically for botany.

**Respondent 18 09:43**

Okay, so from what you explaining, just correct me if I didn't capture it correctly. So, you introduce them to the basic principles in the general biology module. And then maybe you go in further with the botany module when you have them and that separated Well, they take that in, within a semester they take each module within semester.

**Megan Roberts 10:10**

Yes.

**Respondent 18 10:12**

Okay. Um, and specifically regarding this question, you referring to the general biology or the botany module.

**Megan Roberts 10:25**

the botany module,

**Respondent 18 10:31**

Then all of them.

**Megan Roberts 10:34**

Okay. Why?

**Respondent 18 10:44**

This, this might heavily be biased or informed by my previous experience, because I'm thinking, by the time they get to the botany module, they would have had some introduction into maybe cells organelles. So, structure and maybe a relationship between structure and function, then can be introduced in the botany module, because they already have the, the background on understanding what’s there within what makes up the plant organs, themselves, and then trying to explain relationships in terms of information flow, exchange and storage, pathway transformation. Evolution might be a bit advanced, but I see it as fitting as a follow up module to a general biology module. systems. Yeah, you can introduce them to systems at the botany module stage. And I'm just taking this from a perspective that they would already be introduced to some of the basic concepts within plants together, we'll be trying to cover all the other biology concepts. Yeah. So, all of them.

**Megan Roberts 12:24**

If I had to put you in a difficult place and asked you to pick your top two, which two would you think would be most important out of those to do in the botany module,

**Respondent 18 12:46**

Structure, form and function. And I think, part of the information flow, and I'm thinking you're talking about metabolic processes, that might be covered within function. So, it wouldn't really have to stand as an independent concept, obviously it can be broken down depending on how the module is structured. But it will be quite closely related. So, the second one being pathway and transformations of energy and matter. Maybe evolution and systems are a bit more advanced concepts that may follow after that.

**Megan Roberts 14:02**

Okay, and if you had to pick one that would not be taught, which one would it be?

**Respondent 18 14:28**

evolution, but they'll need to be introduced to it somehow. So, they can choose if they want maybe to do a project that relates to evolution. Okay, maybe at a deeper level if you introduce them to projects at a third-year level.

**Megan Roberts 14:52**

Then, my next question, which of the following threshold competencies Do you think should be incorporated? So, first year plant science module, the process of science, interdisciplinary nature of science, integration of science with society, communication, collaboration, understanding and interpreting data and quantitative competency.

**Respondent 18 15:21**

You want it? Would you like me to rank them?

**Megan Roberts 15:24**

Yeah, ranking them is fine.

**Respondent 18 15:27**

Okay, um, process of science, that first integration of science to society that second, interdisciplinary is third, communication, fourth, quantitative competency. I feel that people need to understand that science is all about testing hypotheses. And addressing objectives so that you can collect some sort of information that needs to be reported. And, for me, I specifically used a quantitative approach to collecting any form of evidence. So, I think people need to be introduced in that. And the reason why, and I'm reflecting back on this is because, and usually well, I'm assuming that at first year level science for science degrees, people will be required to do some statistical analysis or even a math module that teaches them how to do basic concepts in terms of what to look out for what data, how to collect information, quantitatively do a bit of analysis, where you can, it's just intro an introduction, but usually a link is missing between that and the different fields of specialization that they later take. So, if within plants they introduced to a little bit on how quantitative data is collected, may be collected for the different fields that will help, it just it's not so much of a surprise when it happens much later, when let's say you are now doing a practical assignment and they have to work with means, standard deviations, errors and all of that. So, it doesn't become such huge concepts and a huge leap and because the module that first year level is so divorced from each other. So, that is quite important. And then communication, obviously comes on bit by bit as they develop in their studies. Collaboration, yes, introduced at the point but may not take that much priority. So, I think when I said quantitative competency, that sort of ties in with understanding and interpreting data, but it comes up, understanding and interpreting data comes after quantitative competency.

**Megan Roberts 19:09**

Okay. So why your first, your first two was the process of science and integration of science with society, right? Yes, why would you pick those two to be your top two.

**Respondent 18 19:28**

I'm a bit shy to say this, but I take a very pragmatic approach to life. If there is no point to them learning what they learn, then we might lose them in a system very quickly because you need to explain why they they're doing what they're doing and create a relationship between that explanation and how society functions, the quicker we get to the point, I think the quicker person can arrive at a decision on whether this is important or not. And if we don't get to, to explain or create that link for them at first year, then people tend to find themselves elsewhere. In first year, level, it's a matter of just trying to inspire people and then develop talent. So, if those are the two goals, then you need to tell them why they are doing what they're doing. Why does it matter? So that link, process of science and just creating a link between that process and in society and how society functions is very important?

**Megan Roberts 21:07**

Is it any one of those that you think is maybe too complex, or that shouldn't be put or focused on in a first-year module?

**Respondent 18 21:26**

Collaboration. So, let's say you've got a mod module. So, your quarterly module, Megan, does it have a practical component, the assumption that it does like to do give them practicals as groups or, or they work individually? What's the approach?

**Megan Roberts 21:52**

Some of them are groups, and some of them are individual. So, if they have lab work, so we have a microscopy practical, that's one of them. That's individual. But we also have ecology based practical, where they have to run data and stuff like that. That's also individual. And then we have a couple of other lab experiments, which they do in groups of like three or four.

**Respondent 18 22:28**

I understand, it's a matter of prioritizing what you want to fit in a module for me. If it was a matter of priority, and I had to take out one or two to implement at a later stage, it will be collaboration that can wait even though it's important, but it can wait maybe for them to start doing that its second-year level.

**Megan Roberts 23:01**

Okay. Then, did you read through the information leaflet that I sent you?

**Respondent 18 23:08**

Read it last week? Okay. There was a link you gave?

**Megan Roberts 23:16**

Yes.

**Respondent 18 23:17**

Okay,

**Megan Roberts 23:18**

the concept of vision and change that we're using to transform our module, and do you think that that's a good way of doing it?

**Respondent 18 23:35**

I'm looking at it now. Hence, the just me being quiet a bit.

**Megan Roberts 23:43**

Okay.

**Respondent 18 24:24**

Yes. So, using the American Association for advanced science as the reference. Yes, absolutely. I'm happy with the concept today actually reflects some of the concepts that we've been talking about discussing. Yes, I think all of them are quite important. For me, it's just the level of importance that the allows me then to rank at that level.

**Megan Roberts 25:05**

Yeah,

**Respondent 18 25:07**

I'm a bit, I'm a bit mindful of the load of information, I guess it's something we never quite, we can't know. And I'm sure we can measure it, it's just that we've, we've never measured or assessed it or I haven't heard of anyone who's measured or assessed it on how much of the information that you would you'd learn maybe even you could reflect a little bit on how much of the information that you learned at first year botany that you ended up remembering. Three years, five years down the line. So, for me, I'm always concerned about, not so much as trying to teach as much as possible. But rather to, to instill as much as possible. And in trying to instill as much as possible sometimes may mean you, you optimize on the quality, rather than focusing so much on the quantity. And so, the question at the back of my mind has always been, am I giving the next person too much such that, then they give up on really assimilating the information so that they remember and keep and then it becomes useful to them in that sense, but rather, they just get through it?

**Megan Roberts 26:47**

Yeah,

**Respondent 18 26:47**

you know, maybe I'm just overvaluing what we teach, I wouldn’t really want to teach something that someone is going to forget, in three years. I'd like to, I'm just like that. And I'm one of those people who really try very hard to make it memorable and make it last on you. So that, if you remember, even if you are no longer in the botany field per say, but you become a botany ambassador, you coordinate that engineering where you go into and you still apply botany principles. So that is how can when I answer the questions for you, I'm like ranking it, because I'm a bit concerned about not trying to fit in as much as you can. But knowing that sometimes you don't really have to fit in as much as you can. You just have to fit what is necessary. So that you, you receive Well, you can achieve maximum impact, and it creates that lasting impression. And you find that when you do that with the person, they most likely going to like what they learn and see themselves developing further. But if you focus on jamming in as much as you can, then you get those who can assimilate as much as they can within that space of time being the only ones who do remember. Well, I again, I'm not saying I'm correct, I'm absolutely 100%.

**Megan Roberts 28:39**

I think that's a good way of looking at it personally.

**Respondent 18 28:45**

Okay, I hope that answers the question that at least gives you an idea of the perspective and taking on answering.

**Megan Roberts 28:55**

Yes, it does. Okay. So, what do you think the barriers to changing a first-year curriculum will be?

**Respondent 18 29:26**

I honestly don't think there are many. It's just that the way that the change is delivered, is to be appealing to the new recruits. Because if you are new recruits a first year, they don't really have a previous impression on what university was teaching. The university was teaching the module like, well what it was before, so I cannot see resistance. Coming from that angle, maybe from just thinking you change from a status quo now you're introducing something new. So, if you deliver it in a in an attractive manner that appeals to the young people, really it has to appeal, make it appeal, use a bit of technology make it easily relatable to what people go through every day. Then there shouldn't be a lot of challenges maybe the challenge might be in the person who's meant to implement the changes because it means catching up to what's happening now. Which might have not been a requirement for a while. Depending on when last you updated the module itself.

**Megan Roberts 30:59**

And in terms of faculty's position, do you think that there'll be resistance from like faculty? higher up management?

**Respondent 18 31:17**

I don't know what processes you follow when you revise your modules, and also which bodies you've got the module itself registered with? Is it accredited by anybody's because all of that will depend? Let's say for instance, you've got a module now that is recognized by SAAB for a particular purpose, or recognized by SANBI for a particular purpose. Then if you revise it, obviously, it has to go through being reviewed, whether it still meets the standards for its accreditation with the different bodies. So yeah, that's institutional and maybe departmental based. It depends on how many gatekeepers do you have to go through to actually implement any change or update? It's not something I can sort of comment much about from outside.

**Megan Roberts 32:44**

Okay, so the, the barriers that you did mention, do you have any suggestions as to how we might overcome them.

**Respondent 18 33:01**

Um, industry stakeholders, let's say it's now recognized by SANBI for a specific purpose, a consultative approach. So rather than submitting a final updated module, go through an interview process where you ask them what they require in terms of industry, and then integrate those changes into the module to update it. so that by the time you resubmit a review for them to say it aligns doesn't align, there's a great greater chance of you getting a yes, or an approval, rather than trying to update from just interviewing me who is still within a university and is not really a direct beneficiary of the students you train, well I could when they come over for PhDs and masters. You know, like, just interview the stakeholders, direct beneficiaries, the people who take your graduates maybe after your first degree, and then from whatever they give you, then you try and implement some of those changes, obviously, with a balance between what you already have, what you can do and what they need.

**Megan Roberts 34:31**

Okay.

**Respondent 18 34:33**

I see that as a much better approach than just yeah. going the other route?

**Megan Roberts 34:42**

Yeah. In terms of lectures, what kind of resistance Do you foresee they would have to change being introduced

**Respondent 18 34:57**

lectures It's just, it's the people involved who may be challenged. Because depending on the amount of work required, that may require a lot of work, extra work hours, to now try and conduct any interviews, try and link this to other modules, try and organize assistance if you have any tutors, demonstrators, lecturing assistance. So, trying to put all of that together would require more time. So obviously, implementing such can be overcome by creating some sort of incentive. Some sort of incentive for the person, or the people who have to update. They don't feel like it's an extra job at no cost. Well, yeah, at cost to them, but no ruined. Yeah. So that's the only resistance, I can see that maybe you get from lectures. But in a long run, this is a high likely going to work. Oh, I'm just remembering something else. Now, Megan. So, in terms of trying to improve, also find out what the other modules in the other institutions are like. So that it, it still, obviously, this, this alone would give you two benefits, it allows you to check the standard across everyone else, it also allows you to stay ahead of the crowd. Yeah, so you can, so you can check the standards and then see that maybe, okay, maybe we run about average, but we would like to improve and lead the pack. And then if you are standardizing like that, it, it allows you to get that advantage because and how you implement this is you get people from the other institutions, you'll have to identify the institutions you're interested in standardizing with or maybe comparing your modules to, and you approach people from those institutions, and you ask them to assist in the review, or the updating of the module. I think some colleagues would be happy to do this. Because we do get incentivized by institutions for the participation, we, we do with other institutions. So, if I sit and I'm reviewing your module or I'm assisting in your module, obviously they didn't allow me even as a participant to then check where I am with my module against what you have. So, people are quite willing to do that.

**Megan Roberts 38:20**

Thank you for that suggestion.

**Respondent 18 38:23**

Okay.

**Megan Roberts 38:25**

Okay, what could potentially be a good selling angle, but as to motivate people to be willing to take part in the change?

**Respondent 18 38:36**

Um, staff, or students or both? I’ll start with students, students would not, I don't think that students would have a lot of resistance maybe previous, or those who are repeating the module might be resistant. But use current trends in terms of teaching, I know now everything's online. And maybe there might be restrictions where most things online, there might be restrictions in terms of how much engagement, physical engagement you can have with the students. So, you can use things like videos, YouTube videos, I know we use Lab Star, to try and create practicals online that they can engage with something that looks more like a game and is more engaging, but still integrates concepts in plants. So that they, they get to have some practical feel in doing it maybe to take it even further. Something that's easy to do with your cellphone as well. So, a person would not be limited in terms of what they can use to get the task, or the practical component done, that will excite students, definitely, that really excites students. Okay, I'm confident it will excite students. And then in terms of staff, it's like I said, you have to create some form of incentive for the person who has to take on the task of implementing the change. If you just think of yourself, if I think of myself as an individual, it's I've been teaching a module for the past three, five years. And it's been going just okay, now I have to update it, it's much easier to take on the task, if I know, there'll be some sort of recognition or reward from doing that, especially if it's going to involve additional work to what I've been doing. Because if you think about it really means the way of assessment is changing, maybe even the material you're using for your assessments is changing. So, if you have been using, maybe recycling some of the material over and over and updating books, is things that we sometimes don’t want to talk about, but they have been maybe recycling some material for two years. And now you're required to update a module means that you basically have to start from scratch. So, it helps so that the person is much happier doing the task.

**Megan Roberts 38:45**

both. And then, in terms of practicals, how important do you think hands on practical sessions are for first year plant science course.

**Respondent 18 42:05**

They're highly important you can't do without them. It's, it's easier to remember something if you have an experience of it, then to just hear of it, or read of it and walk away. It just, it's just easier I don’t know why we work like that. But it's just easier. Maybe there's some people who do differently. But with experience, like something is as small as how something felt or how you felt when you were doing the task, how we didn't work. would make you remember. So, they're absolutely important. And within the plant sciences, I find them it's something you can't replace, you can't like, you cannot replace I remember when we when the COVID challenges started hitting hard last year and everything had to go online. Like really, for me, it was just basic postharvest physiology. But I requested a person at least gets the tomato I'm talking about. And they actually look at the tomato and they can see what I'm talking about. And they can put it there and see the change I'm talking about. Because it's much easier to remember. Then just me saying, yes, the color changes from green to red. And they have absolutely no concept you can assume as a person, because you've, you've seen a sale a structure of a cell so many times and everyone knows what it looks like. If they don't know, and you are teaching them about what it looks like, and you are showing them some sort of picture what it looks like. It's highly likely going to escape the memory.

**Megan Roberts 44:17**

Do you have any suggestions as to practice that we could potentially run or skills that you didn't have particularly important for first year to grasp in a practical session?

**Respondent 18 44:34**

Megan to help with that. I'll have to have some information on what you already do to

**Megan Roberts 44:43**

what we do microscopy work. So, a practical on that. We do practicals on structure and function. So, we get a whole bunch of leads showing that Opposite leaves. And when the when the lead structures are staggered and flowers and all sorts of stuff, and then we go through it with them and let them see and touch and feel we have a prep with the ecology section of the module where they have to run. It's based on the island biogeography theory where they have to run different scenarios on a program on the computer and see how it changes and interpret that data.

**Respondent 18 45:37**

That's nice.

**Megan Roberts 45:39**

Yeah, that's a very cool one.

**Respondent 18 45:42**

It sounds it. Sounds nice. Okay.

**Megan Roberts 45:48**

Yeah, I think I can't think of what the risks are now.

**Respondent 18 45:53**

Um, do you have anything that that that shows how maybe plant processes functions, metabolic processes can be influenced by different conditions, environmental conditions? Or even chemicals?

**Megan Roberts 46:19**

I don't think off the top of my head, I don't think we do know.

**Respondent 18 46:25**

Okay, from what you are saying, I'm thinking there will be a nice thing to do, where maybe, if you've got some plant cells, you can open parts, organs, you can introduce an environmental or chemical factor, and let them watch maybe how the dehydration affects the structure with the form or how a particular chemical would affect the structure or the form of their plant organ.

**Megan Roberts 47:02**

Like that.

**Respondent 18 47:06**

They'll be nice. And in terms of introducing concepts, and in ecology, and also like, things like extinctions, climate change, why things occur, in some places, and not in other places, and so on. I'm not sure if he did it. It's making sense.

**Megan Roberts 47:43**

Yeah, no, it does.

**Respondent 18 47:44**

I hope it does.

**Megan Roberts 47:45**

It does. Okay, um, so that's all from my side. That was my last question for you. Do you have anything that you'd like to add or anything that you'd like to ask me?

**Respondent 18 48:07**

What, what? what sparked the interest to update your module? Megan?

**Megan Roberts 48:13**

It hasn't been updated in quite a while. So, I know not since I did it, which was six years ago now. And I think before that it hasn't. So, I think we've just reached the point where we are looking at everything that's happening with, you know, transformation, and we're trying to move towards a much more relevant module for living in South Africa. One that's locally applicable teaching things that are locally applicable. And I think just all of that, we've just decided that it needs to change.

**Respondent 18 48:57**

Okay. Well, it's a good move. It's an absolute, I feel for the person who's going to implement the change. But you guys starting with doing a study like this is going to go a long way towards assisting in it. So, it's cool, it's definitely going to benefit the students, but do look into I really, really, now that you've had the opportunity, I might be saying this because I'm not the one who's supposed to update the module so the work will not be done by me. But do look into interviewing your partners or the people that hire graduates. Yeah, just interview them, reach out to them, then there might be quite happy to assist and just ask them what they would like to have the, the employees know what skills and then you can try and incorporate that. Then it becomes more relevant. And then when you when the students enroll, this is what we we've done. So, when the students enroll, you tell them about the various stakeholders, you can hire them and what they're looking for. And when you describe what the stakeholders are looking for, he actually described components or sub topics of the module itself. So, they are interested in the like, if I learned this, this company is going to hire me.

**Megan Roberts 50:32**

That's a very good way.

**Respondent 18 50:35**

We can try that last year, I guess we'll only know in a couple of years’ times. Just put it out there. We're like this, this these are the companies that look for this, they look for them. And then people are happy to learn. It just takes some of the pressure off of you in having to demotivate them and encourage them to learn this particular concept. They know if I lend this alcohol and use it.

**Megan Roberts 51:04**

That's, that's very clear, but I hadn't considered doing that. So, thank you for that. So

**Respondent 18 51:09**

don't quote me anyway. I was selling things. Okay, okay.

**Megan Roberts 51:21**

Okay, I'm going to stop recording now.