Respondent 19 Interview

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**SUMMARY KEYWORDS**

students, plant, module, plant pathology, science, practical, botany, include, struggle, change, understand, plant breeding, year, work, evolution, question, difficult, concepts, teach, basics

**SPEAKERS**

Megan Roberts, Respondent 19

**Megan Roberts 00:02**

Okay, so I'm just going to ask you a couple of questions and we can sort of have a discussion about them. And that shouldn't take more than an hour. Okay, so can you please start by stating your area of expertise?

**Respondent 19 00:25**

Right, I'm a plant breeder from training, and more a molecular plant breeder. But I'm currently head of the department of plant sciences. And the department consists of botany plant breeding, and plant pathology. So, we tried to integrate the three disciplines into the one department. So, we do work in sort of all three disciplines.

**Megan Roberts 00:50**

Alright, my first question is, is plant blindness or a lack of interest in plants a problem in your institution.

**Respondent 19 01:04**

Yes, for some reason or other students know about zoology and all the other things and we struggled to get students interested in plants. So, I don't know if it's maybe due to not being exposed to it or having a bad experience in high school biology on plants. And I know, I also think some students do not have the knowledge of what jobs they can have in the plants. So, I think that might be some of the reasons why we struggle to get students in plants interested in plants.

**Megan Roberts 01:45**

And do you have issues getting students to enroll for your plant science degrees?

**Respondent 19 01:53**

Yes, and no, because, as I say, plant sciences consist of the three divisions. So, with botany, we don't struggle that much. I think mainly because some of the education students who's going to teach biology needs to take botany at secondary level. So, we have a little bit more botany students. And they also in specific areas of botany like ecology. And then we struggle a little bit more to get students interested and enrolling for plant breeding and plant pathology.

**Megan Roberts 02:26**

And on a postgraduate level,

**Respondent 19 02:30**

Postgraduate level, we do have a lot of plant breeding students, less plant pathology, and as I said, with botany, it depends on the sub discipline within botany. So, we have a lot of ecology students, but then taxonomy and the plant physiology, not that many, also, because students might think that that is too difficult. But yes, we do have I think, enough postgraduate students in botany.

**Megan Roberts 03:01**

Okay. 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 19 03:22**

My personal view is that it should have a broader context. Because from experience I know in the university, your first-year biology or plant sciences module is the foundation for all the other modules. So, if we can, if there's a broader context, then you can help students in all the directions that's going to use the plant sciences module for the second or third years, because students from zoology, geology, the Agricultural Sciences, all of them will take the first-year module. So that's for my experience, I feel that it should be a little bit broader, that will allow the student then to continue in any direction, within plants in the second year, and they can see what they like and continue with that.

**Megan Roberts 04:18**

Do you think that having a broad approach could potentially help pique the interest of other students who are not maybe necessarily enrolled for plant science degree but have a module of it?

**Respondent 19 04:33**

Yes. What we tried and it's really working for us is that we also expose the first-year students to plant breeding and plant pathology. So, there's a little bit of that in there as well, because and then students will change and see, but they are interested in that. So yes, I think because, from my experience many years ago, when I came to university, I didn't really know what I are really interested in for my first year when I got exposed to certain subjects. And I realized that I'm interested in that. So, a broader base will Yes, definitely, I think get more students interested in specific areas, then working with plants.

**Megan Roberts 05:20**

Okay. So, my next question is a little bit of a longer question. So, I'm just going to post part of it in the chat box. So, which of the following concepts Do you think should be incorporated into a first-year plant science module? evolution, pathways and transformations of energy and meta information flow, exchange and storage, structure and function and systems?

**Respondent 19 05:57**

Okay, evolution, I think, yes, because that forms the basis of the explaining the origin and the history of life. And then you can link that to taxonomy, systematics and phylogeny. So, I think, definitely evolution, because that will be the give you the basics for how plants develop. Pathways and transformation of energy and matter. If that includes if you honor that means photosynthesis and respiration, I also would think that that should be included. That also forms the cornerstones of plants as well as the transport of molecules in the plant for energy and survival. And you need to understand that to really understand what's happening within a plant. Then information, flow exchange and storage. Can you maybe just explain what you mean by that specifically.

**Megan Roberts 06:56**

So that's more of a like genetic component, how information is stored. So, in terms of genes and stuff like that,

**Respondent 19 07:12**

Then Yes, because I've thought that's the basic concepts of DNA structure and function should also be included. Because these days, almost everything is now based on molecular work, whether you're doing plant breeding, Plant pathology or botany, you have the systematics, the sequencing. So, students need to understand that as well. And especially Also, if you have maybe students that will continue in genetics or microbiology, that that will also help them to understand that. And even though the students do this at high school, they forget about it. So, it's good to just remind them again, of the basic DNA when they come to the University in the first year. The structure and function, yes, I think you need to understand the cell structure, the membranes, and everything of the plant cell to also understand the processes that takes place in plants. So, I should say that should also be included. And then on the systems, can you just What do you mean, specifically my systems

**Megan Roberts 08:19**

as also from like an ecological perspective, systems cycles, nitrogen cycles, stuff like that.

**Respondent 19 08:30**

Yes, I think to a limited... not at I think in too much detail, but the basics would help for that. For the first year.

**Megan Roberts 08:44**

If I had to ask you to pick your top two, which ones would you think would be most important to include?

**Respondent 19 08:54**

That's a difficult one. Maybe evolution and pathways and transformation, the first two, because you have to build on that to understand the rest, but then you need to know structure as well. So, but if you have to choose the first two,

**Megan Roberts 09:17**

Okay, and one that you think is less important that we could maybe leave out?

**Respondent 19 09:25**

I think systems

**Megan Roberts 09:28**

Alright. So, my next question is also a bit of a longer question. So that will post in the chat as well. Which of the following threshold competencies Do you think should be incorporated into a first-year plant science module, the process of science in the interdisciplinary nature of science integration of science with society, communication, collaboration, understanding and interpreting data and quantitative competency?

**Respondent 19 10:01**

I think most of them, I would include. But I would include other things as well maybe, such as, such as we've seen from experience that your first-year student doesn't always have the necessary computer literacy, I would include something more computer based, and then especially assisting them with these days, we are moving more towards online, due to COVID, but also other online techniques that they need to know. And they struggle with that. So, I was thinking that competency as well. And then also students really struggle to write. And if you in a plant sciences module, you will have to do practicals with practical reports, I think students should also get some training on how to write scientifically and what is expected from a progress report or a practical report. And they really struggle with that and move into the interpretation of the data. But I think that is mentioned there somewhere, they understand and interpret data. So, this the process of science and interdisciplinary of science, I mean, the integration with society, can most probably be under one heading, just to see how science is linked to the environment. And I think that's important to include for students, because they don't always understand what we do here, how that's linked outside with nature, how it influences social wellbeing in the society. So, to open the eyes to see, but this is what we're doing. And this is what we can do out there with the science. I think that's important. Communication, if you say under that that communication, oral and in presenting PowerPoints, then yes, that should fall under that because students who struggle with that collaboration, I'm not totally sure what you mean with collaboration,

**Megan Roberts 12:13**

Collaboration, it's being able to work basically in teams. So, group work, being able to work with other people.

**Respondent 19 12:28**

Yes, yeah, I, we include that as part of, of how we teach and myself as well, so that students do individual work, and also group work. So yes, I think that is important. And as I said, planning and interpretation of data. And then quantitative competency. Do you mean that I need to be able to represent the data accurately or?

**Megan Roberts 12:53**

Yeah, so being able to read graphs and understand what data is telling them? from reading a graph and also making graphs? It's, it's very similar to understanding and interpreting data.

**Respondent 19 13:08**

Okay. Yes. Okay. Thank you then that the basics of that should be also included.

**Megan Roberts 13:16**

If I had to ask you, again, to pick your top two most important ones, which would they be?

**Respondent 19 13:25**

I would say communication and understand and interpret data.

**Megan Roberts 13:31**

Okay, and one that is perhaps less important and could be left to like a later stage.

**Respondent 19 13:44**

As I said, A, B and C I would combine into one I won't make it three different ones and then one can fall out sort of I feel that can be done under one heading, Process of science and something that are the links with nature and the society.

**Megan Roberts 14:04**

Okay, so would you leave? Would you leave that one for a later stage then?

**Respondent 19 14:09**

Yes. That's difficult because you need the basis for that.

**Megan Roberts 14:18**

Yes, it is a difficult question.

**Respondent 19 14:21**

But from what I've seen the students where they struggling, I would definitely say they need to learn how to communicate orally and so with PowerPoints and to how to write a report. So that will be because they can need that for the rest of the career or for the time at the university. So, for me, those are very important skills that I should learn.

**Megan Roberts 14:49**

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

**Respondent 19 14:58**

Yes.

**Megan Roberts 15:00**

Okay, before you read that, have you ever heard about the concept of vision and change?

**Respondent 19 15:06**

Not in that format no.

**Megan Roberts 15:08**

Do you think it's an acceptable way to maybe use as a template to change the module? Yes,

**Respondent 19 15:19**

it can provide a good basis. But I think also your, the module content, I think, is also been determined by your environment, so and what you teach students and what you want them to achieve. So, I think the content for a university like Pretoria that maybe serves other students compared to Bloemfontein that has more rural students and students from QwaQwa as well, I think it will be different. So, you can use it as a framework, but they should be adjustments based on your specific students and your second- and third-year modules and what you want your students to learn, so that they can continue with that in the second or third years.

**Megan Roberts 16:14**

Okay. Then, another difficult question. What do you think the barriers to changing a first-year curriculum will be?

**Respondent 19 16:29**

People don't like change. And they, especially if they've been at the university for a long time, I don't want to say old people, but they don't like change, and they want to continue the way they've done before. So that might cause a little bit of problems. And then, because if you change a curriculum, it means someone has to put in the work. And some will have to do a lot of extra work. So that might make it difficult to incorporate the change.

**Megan Roberts 17:05**

Do you have a suggestion as to how we might be able to overcome that?

**Respondent 19 17:09**

I think if you write a good motivation on why you need to change the content, and link it to how it will benefit the student and the student, preparing the student for the for the job, and the information that they will need someday when they start working, I think that can be a good motivation to seek to say how it will be in favor of office students. And also, if you tell the people, the staff, that you know, if you change this, you will form a better basis or a foundation for your second- and third-year modules. And the students that come in through the system will then be better equipped to do the second- and third-year modules, I think that can also motivate staff, if they know they're going to get better end product coming into the second or third years. And I think also, if you provide whoever's going to do you have to make the change to give him enough support, saying extra time to develop a module, the necessary infrastructure resources assistance button that might also help them to then know that they will be able to do this change?

**Megan Roberts 18:38**

And in terms of lecturers specifically, what kind of resistance Do you think we could potentially get from them regarding a change in the module

**Respondent 19 18:50**

I think I sort of covered that is that I feel it's going to be a lot have to change. And it because it will take time to develop the module. And if you're teaching other modules as well, then you might feel that you don't have time to do develop a new curriculum. But you can overcome that with good motivation. So, I think that might be and people don't like change. They usually resist doing things differently.

**Megan Roberts 19:28**

So, we've also sort of touched on this, but what could potentially be a good selling angle for us to motivate people to be willing to take part in a change.

**Respondent 19 19:41**

I think like I mentioned to save but what benefit that will have to the student and also for other lectures coming as I said in the second and third year and having students better prepared for the second and third year and giving them the necessary resources to develop a new curriculum

**Megan Roberts 20:05**

Okay, um, do you think that it's, it can be necessary to update modules every now? And then?

**Respondent 19 20:14**

Yes, it's definitely necessary, because the information out there changes the needs from what needs to be done in a work situation that change now, we need to adapt to that. Yes, because there's always new information out there. And we need to do to keep up to date with what we teach the students and how we teach them.

**Megan Roberts 20:44**

Okay, my final question to you then. How important do you think hands on practical sessions are for first year course?

**Respondent 19 20:56**

Very important. I know it's difficult if you have a big first year class to do the hands-on practicals. Because usually you don't have the necessary space in equipment. But that's where the students learn some necessary skills. And I think it's also nice to do things practically for a student and that not just having a another, dry practical and not being exposed to the science. And that can also get more students to continue if they doing really practical, they enjoy. But that experience working in the in the lab situation or do a practical, I think that is really necessary. Many of our students come from environments where they were never exposed to plants or two DNA or some of them don't even know how a maize plant looks like. And giving them that exposure during a practical can do wonders and just open the eyes and to the world out there.

**Megan Roberts 22:07**

Do you have any suggestions as to pracs that could be useful to run or skills that you think are particularly important for a first year to know?

**Respondent 19 22:24**

People who's presenting the first year's might be a better to tell you that. Because we also struggle. So, we have a combination of wet and dry practicals due to limited space. But I think you can do a very basic photosynthesis experiment without having to do a lot of science, you can see how plant photosynthesizes or how it how oxygen has been released by just putting a plant in a water tank and being see the bubbles and things like that. So, there is some practical ways of presenting some of the difficult concepts that a student might struggle with. If you do respiration and photosynthesis. I think that can be a nice practical to do with them. And then also expose them to plant material and different plants and tell them look at the plant. How is this plant adapted to its environment? for drought or for water. And that can be plants that's on campus that they can see every day, and then you can show them but this is how adaptations is done and how evolution has happened over time. So that can be a practical application of what you taught in theory.

**Megan Roberts 23:51**

Okay, well, that's all the questions that I have for you. Do you have any questions for me or anything that you'd like to add?

**Respondent 19 24:05**

No, I would just like to say good luck with the new curriculum. Thank bar is exciting because you have an opportunity to change something and to really make sure that the students are being taught what they need for the further studies but also saw maybe future so I think it's a great opportunity to be able to look at the curriculum and see how you can change that.

**Megan Roberts 24:30**

Thank you. Okay, I'm going to stop right