# MODULE FOUR
## Getting Results – Module Overview

**(music)**

**Bransford:** Connecting what you do in the classroom to the community is probably a prime motivator, especially for most people that come to community colleges because they really care about their everyday lives and the lives of that community. And so the more you can see that what you're learning in school is relevant to that community, and also that the community is helping you in your learning, I think, is a motivating issue.

**Man:** A more proper term for this would be a foam fractionator.

**Narrator:** Dave Berens and Bruce Koike co-teach a course on aquarium life and support systems.

**Man:** Dr. Ken Yeats is going to talk to us about ozone and its applications.

**Narrator:** They've invited visiting aquarium director Dr. Ken Yeats into their classroom to share his expertise as a guest lecturer.

**Yates:** What things do you know about ozone? Review it over with me.

**Man:** Highly reactive.

**Yates:** Highly reactive, you bet. What else?

**Woman:** It's used as a disinfectant.

**Yates:** Used as a disinfectant in some cases, yes. What else?

**Woman:** It occurs in the atmosphere.

**Yates:** It occurs in the atmosphere, yes.

**Woman:** It oxidizes metal, so it'll corrode your equipment.

**Yates:** Oxidizes darn near anything you get it close to.
My goal was to have them understand how ozone works in the systems and what the dynamics are, how you measure it. Also to give them some instances from real life experiences of how some things have been learned the hard way.
It can give you headaches, and some people are extremely sensitive to it, and those are people who you want to help you find the leaks, okay, who you want to listen to. Never increase doses at the end of the day, and watch your animals for behavior. Your operators may have the luxury of going and looking at the computer first, okay? What you should do when you come in, look at your animals first.

**Man:** We talk about the theory of the things that we're going to work with, and then we go into a lab and try to apply that in some way or another, and give them as much real-world experience as possible.

**Narrator:** To reinforce what the students have learned in the lecture, Dave Beren leads them through laboratory experiments that illustrate how ozone is used to purify water.

**Beran:** Basically, we want to try to take a look at how much material is being produced by these foam fractionators if we have a certain level of ozone going into it, like Dr. Yates talked about, compared with air. And basically what we need to do today is set everything up and get it going.

**Beran**: But as a class, we wanted to try to look at something that in theory should happen with the foam fractionators. We should get some better foam fractionation depending on how much ozone we're providing. And so we decided to set up an experiment to see that. And are we going to go with a certain amount of water or are we going to go to a top mark?
We broke it up into three sections, and one part was the water chemistries that we'd like to keep track of.
Did you bring the pH down?

**Beran**: And we also had to take in some other variables about the bioload going into it, and so I had another group of people working on that section of it.
You're going to get a lot of stuff on top of the lids that you're going to want to measure, too. And there's some tape right there.
**Beran**: And we had another group of people building the systems and building the sumps where the fractionators were going in, and setting up the plumbing.
How's it going over here?

**Man:** Well, these each have two ports in them…

**Woman:** Oh, so you got to unplug one of them.

**Man:** And we've got to unplug one of them, so this is my only homemade deal that I got.

**Beran:** How are we going over here? How are we doing?

**Man:** These two are 75 liters…

**Woman:** Okay, well….

**Man:** …so it works pretty good at nine inches.

**Beran:** Okay.

**Man:** Sweet.

**Man:** The whole point of what we're trying to do is to figure out whether or not if we inject ozone into the foam fractionator, whether it increases the efficiency of its ability to take the organic matter out. So this one won't have any ozone; it's just going to be plain air. That one will have a lot of ozone injected in, and that one will have a medium amount of ozone injected in.

**Beran:** We've got all the data, I think, recorded for each group that needed to record data, and we're going to go over to the Oregon Coast Aquarium and we're going to go and look at the ozone generators over there and how it's put together.

**Man:** We will be going to the Oregon Coast Aquarium. They have several large ozone-generation systems and foam fractionators, and this is really where the conceptual ideas get applied to the workplace.

**Narrator:** As the students wait for the results of their experiment, Dave Beren and Bruce Koike connect lecture and lab to the workplace where they'll see real-world applications of ozone purification.

**Beran:** So if can have everybody's attention, the ozone in this room is being used for both disinfection purposes for passages, and it's being used in the foam fractionators over at industrial holding …

**Koike:** It's those foam fractionators and pumps that the students will be working with when they get into the jobs, and so for them to be able to see the operations of actual aquarium systems components is real important.

**Beran:** If you take a look up there, you're taking a look at two pretty good-sized foam fractionators. You can see the rotometers hanging off the sides on the left side of each one.

**Man:** Today it was great. Taking the theories that they teach in lecture, showing how you can apply them in lab, and then taking you to a place where they actually are being applied in the professional workplace.

**Beran:** You can see the water flowing through there. That helps to clean out that venturi injection system. Now, would you be happy with that foam production?

**Students**: No.

**Beran:** Why not?

**Students**: Too wet.

**Beran:** Too wet, right. Like I said, we'll take the information down from the experiments, and we'll be able to see some differences between the levels of ozone going into it and comparing that just to air.

**Bransford:** If I just have people from the community lecture about what it's like outside the workplace, that's not nearly as good as actually experiencing firsthand some of the issues involved. And then ideally that comes back into the classroom and you can start to see how it connects directly to what's being learned in the classroom. So the classroom almost becomes a lab for being able to clarify what happens in the community, as opposed to the community just an add-on to the major thing that happens in the classroom.

## Module Four
## Getting Results – Making Internship Connections

**Man:** We just spent last week out collecting some data. Restart or reset the handheld.

**Narrator:** A practical internship specifically suited to the personality of a student can have multiple benefits for the community at large.

**Man:** The agricultural GPS/GIS technology program is a relatively new program. It's been in operation for about two and a half years and the purpose of it is to educate people that want to go into a career using GPS/GIS to answer agricultural production questions.

**Man:** I wanted to continue my education. My dad wanted me to go to college and get a degree. I could still farm and still go to class, which I commute every day. It's about 45 miles, and it really interested me in the GPS and GIS.

**Brase:** What did you name your files?

**Sheppard:** "Pond"

**Brase:** The students would be involved in a community project as part of their study. It's all good data. It may not look good right now, but after we clean it up, it's going to be very valuable, and put the data behind it, it's going to be even more valuable.
We also involve the industry through travel trips or internships.

**Sheppard:** My internship was at the Ryan Co-op, and I created field boundaries for the farmers and for the co-op so they can see how much product they would need, how many acres that field is. Pretty much information like that, so they had an accurate amount of acres of the farmers' field. The amount of farms that I boundaried was probably about 20,000 acres. Some of the benefits with GPS is preventing wasting of the product or pesticides, which can, in return, cause run-off.

**Brase:** Getting them out into the community provides a little support back to industry. It also provides them with some unique problems that they may not see when they do the project here at Kirkwood.

**Sheppard:** Each one of these fields, you can bring up the name and it'll show all their land, how many fields they have and by using GPS you can receive all that data from, like, picking corn or beans in less than a second rather than waiting a couple days for it to go to the co-op. Before GPS and GIS, they would go out in the field and just spread fertilizer, same amount everywhere. Now you can variable-rate with GPS. Like, the spots that need it the most will get more fertilizer.

**Brase:** I think it also broadens the experience. As opposed to getting just agricultural experience, they get possibly some environmental, some natural resources in the use of GPS and GIS.

## Module Four

## Getting Results – Developing Expertise Through Internships

**Man:** We're going to configure our mother board for our CPUs. I want you to find these jumpers.

**Narrator:** An internship provides hands-on training, allowing students to apply their content knowledge to the workplace.

**Man:** This internship allows a student to go through the process of training, and then utilize the information they received in their training in a positive way. They're working in a live lab, where students come in and they take a computer apart, put it back together again. Sometimes the computer doesn't go back together correctly, so our interns fix the computers in the lab.

**Man:** All set. Thank you.

**Woman:** Cool. No problem.
In the beginning, I was intimidated by, you know, electricity but after being in the class, it's given me more confidence. I can apply what I've learned from the IT configuration analysis because I've already gone through those steps. I think I'm more of a hands-on learner. When you take apart a computer, you know, you'll also understand how to troubleshoot it.

**Helm:** It's not so much they're going to be able to do this in industry. No one's going to ask you to "show me the parts of your computer." What's going to happen is there's going to be problems to solve. The lab is all about solving problems. Industry's about solving problems. It's not about how many acronyms you know but more about how you go in and solve someone's problem in technology.
It feels a little bit like it's running, so you need to figure out what the, what the problem is. There will be a solution to this. We just have to figure out what it is.

## Module Four
## Getting Results – Pursuing Related Work Experience

**Man:** This is the interesting part of this machine here, this section right here. Basically what's happening is ozone gas builds up in here.

**Narrator:** Giving students a chance to apply their knowledge in a public exhibit provides a true sense of working in the real world.

**Man:** Whatever remainder ozone gas is coming off goes into this contraption right here and basically that's your… your destruct unit.

**Man:** I'm a middle-age back-to-school type learner and I say that kind of with a laugh because I've run into a lot of people like that here at this community college, people in their 40s, 50s and up, coming back to school, and that's exactly what I've done.

**Man:** So this hose is filtered sea  water for the main systems.

**Woman:** Green hose?

**Man:** Yeah, the green hose. You can get it over there and run to those things, and I've got a five-liter container right there so you can measure out exactly how much water is going into each one.
We do a lot of our science classes, courses over at the Hatfield Marine Science Center. The second one is the low…

**Woman:** It's the low-width air dryer.

**Glaze:** We use our labs, we have exhibits that we work on. I was working over at the science center for a practicum class, and I said, you know, I said, "Dr. Tim, I really need a job this summer," you know? And he said, "I want to make this an ornamental fish room," and we call it 'the World of Wet Pets.' And he said, would I be interested in doing this? So I've gotten kind of a sneak preview of what the outside world is going to be, and it's great. The first chance I had to work over there, I was nervous. I was like… I don't want to kill any fish, you know what I mean? How long can I keep my job if I do that? And it's not that they want you to kill a fish, but you're allowed to make mistakes. You're allowed to step forward and experiment and be creative.

## Module Four

## Getting Results – Using Job-Shadowing Experiences

**Narrator:** Providing job-shadowing opportunities is another way to expose learners to real industry experience.

**Man:** We basically are a contract company that tests the microbiology integrity of different products.

**Man:** I think for Daphne, she has a good head start on what she really wants to do, and seeing types of fields that she might be interested in doing, because she has experience, hands-on experience of seeing it firsthand.

**Daphne:** Job shadowing will be helpful for me so I can know if I want to do something in biotechnology I can know ahead what kind of things I'll be doing.

**Shakir:** It might be a little… a little funny because you don't know exactly what you want to do yet in your careers, so I can see where this would be a good help for her to see, you know, okay, this is what we do for our job. Since she has all the different types of hands-on experience from watching other people do their jobs in labs, I feel that she has a better chance of making a good decision on what she wants to do with her career.

## Module Four

## Getting Results – Experiencing Industry Interviews

**Man:** Our national visiting committee just came in and as I call your name, if you could just stand up and acknowledge. Why don't you guys turn around? Dr. Bill Fall is from....

**Narrator:** The expertise of visiting industry professionals provides students with a preview of real world expectations.

**Man:** When we looked at the development of this aquarium science program, we integrated input from the industry.

**Koike**: Katherine Ellis from Mystic Aquarium in Connecticut.

**Ellis:** What we're looking for is to see the knowledge base for the students that will be graduating. Part of the goal for this is to make them marketable in the field.

**Man:** Did you bring the….

**Man 2:** They're right there.

**Ellis:** And looking to see what their skill base is and if they would be potential candidates for aquarist-level positions upon graduation.

**Man:** Pretty much just trying to replicate the same kind of system in a small form, then go show them the same aspects over there in a large form.

**Koike:** They're going to also be interviewing our students in a mock-interview format.

**Ellis:** Could you describe a typical day for me and what your responsibilities are now? For example, how many tanks are you responsible for, how many different aspects of the husbandry routines are you involved with?

**Koike:** This benefits the student from a couple of angles. One is, they gain some interview experience.

**Man:** I've had a fantastic opportunity to take a room that had nothing in it basically other than being used for storage, and to design and develop five different systems from salt water to freshwater.

**Koike:** They have an opportunity to see what type of questions are being asked from this type of diverse group, pick out patterns.

**Man:** Name four factors that could be used to modify the efficiency of biological filters.

**Man:** Temperature, the amount of bioload going through your system…

**Man:** They can identify where they're weak and bone up in those areas when the real interview hits.

**Man:** Flow rate going through your filter.

**Man:** That's good, okay.

**Man:** And… let's see, a fourth factor.
My interview was much more of an oral exam than I expected.

**Man:** The bioload's there. You're trying to get rid of it, so that doesn't make your filter more efficient.

**Man:** Oh, okay. Um, flow rate, temperature, uh, pH?

**Man:** Uh, has very little effect on filters.

**Man:** Oh, okay.

**Man:** Plus you can't switch it too much because of the fish you have in the tank already.

**Man:** That's true.
It was very intense on my knowledge of aquarium systems and how I can go about diagnosing a system problem this way or something I need to watch given this situation—that kind of a thing, much more than I expected. And that's good. That way I can learn about it when I… so I won't make the same mistakes I did today if I go out looking for a position after I graduate.

**Woman:** So now it's running real smoothly, it's doing what it's supposed to do and the amount of error that's in the database now is drastically reduced and it's gotten a lot smaller because it's not repeating a lot of information.

**Man:** It goes faster.

My approach is to ask them some of the same questions that I would ask of an entry-level aquarist or biologist and see how they'll respond.

**Man:** I mean, they're looking at a bunch of fledging little birds that don't know exactly which way they're going to go, but if they can direct us one way or the other to make us that much more successful later, I mean, you can't measure the value of that. It's great.

END TRANSCRIPT