

NANSLO Update MP4 Video Transcript

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- Event:** CHEO Discipline Panel Faculty Professional Development Workshop –
By Design: Taking ALL Allied Health Students Across the Finish Line
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All right, so for those of you who don't know who I am, my name is PJ Bennett. I am just recently promoted to the position of the director of the Denver NANSLO lab. I was thinking about a way to try to introduce what's happened over the last several years of all of our work. And what I thought was in February of 2013 when I joined the NANSLO project, this was the list of activities that we made available. This is what we currently have. So this is what we've built in the last two years, or, I should say, this is what they have built in the last two years.

So Farnosh Family is our chemistry discipline head. She's unfortunately not able to be with us today.

Because she had a baby on Sunday. Not unfortunate.

Very good reason.

It's just because it scares PJ.

Lots of things scare me, but that's OK. So, a couple of the things that we've completed since last year, we did the Beer-Lambert's Law with food dyes in sports

drinks. So that's a modification of a lab that we've been using. So the students are actually now able to calculate the concentration of food dyes in standard sports drinks as one of their labs that they use in a chemistry course.

We have also done a titration lab, which should actually be pointed out that way not tucked in. That's my fault. And we have three different ways that we can do it. We can do acid base, citric acid, and to get, which we again do, sports drinks, and then orange juice. And then we're working on one for amino acids. And we've also done a colligative properties, or freezing point, depression lab. We've ended up not doing the Avogadro's number, because there wasn't as much interest, and the equipment turned out to be way too complicated.

Quickly to go through this-- for our learning objectives, they have to be able to determine the amounts of things. That's a general thing for a titration lab-- how much of something is there-- that's the reason you're doing titrations. Citric acid-- we're looking into things having to do with pH, volumes, and how much is in a given solution of a sports drink, whether or not there's differences, and those sorts of things.

Rather than read every single one of these to you, I will move on to-- so our Colligative Properties Lab, which is an entirely new lab. And that one looks at what changes in the freezing point depression based on whether or not you have single or multiple elements in it. So, for instance, salt. Sodium chloride dissolves into two compounds, two ions. So that leaves a greater freezing point depression than if you were just using sucrose. Because that only dissolves into one compound. And the students get to go through this, calculate it, look if they're getting complete dissolution of their ions, and those sorts of things.

And we will now move on to biology.

I feel like a game show host. I'm Kate Lormand, and I'm the biology curriculum lead. So we have a photosynthesis lab and we have an enzyme lab. And the enzyme lab can also be used in chemistry, because it's looking at, well, let's see, go to the next slide. Next. OK.

So the enzyme learning objectives are really to know their functions and their characteristics, to understand how they're affected by different variables. So it's pretty similar to most on-campus enzyme labs where you're looking at the effective concentration, temperature, and pH. But we get them to mostly collect data in

different situations, and then analyze the data after they have run the different experiments. That one ran really well this year. People really seemed to like it. And it has a lot of really nice critical thinking, analytic questions that follow it.

Next, the photosynthesis lab. This is one of my personal favorites, because it incorporates not only the NANSLO lab, but we're asking students to run a self set up lab on their own before they do the NANSLO lab. So, we're combining both your critical thinking-- how would you set up, plan a lab on your own using simple resources like floating leaf disks.

And we give them all sorts of resources-- like you can look at all of these internet-based photosynthesis labs. Just set one up, collect some data, see what you think. And then do the NANSLO lab where you're getting some really high-powered data from doing carbon dioxide and oxygen sensors in different light situations.

So it gives students both a chance to develop their own question, hypothesis, materials, methods for a lab and write up a formal lab from that aspect, and then go and get some very high tech data from doing their NANSLO lab. OK. I think that's it.

Hi, my name is Farrah Bennani. And I'm the Allied Health Curriculum expert. I developed most of the Allied Health lab. The last one that I have added was the buffers, and it was based on a request from faculty during our last meeting when we're here last year in May.

So for these lab, we have basically this unit had to know the definition of what is a buffer, acid, and base, define the pH. And basically they had two set of exercise-- one of them, they will be adding acid to buffer solutions, and then, the other one, for adding a base and trying to find what is the maximum level where the buffer can go beyond this buffering system that we have, in term of its limit.

This lab could be used for general biology, as well as for anatomy and physiology, when we cover the metabolism as well as the urinary system to understand how it could be covered and how the pH blood cannot go beyond certain limit assuming we are in the homeostasis level. Thank you.

Yep, unfortunately, you have to have me again. So, quick update on what's been happening in the Denver lab-- so, at this point in time, we have run about 2,700 unique students through the lab. That works out to about 2,700 student lab

activities that we've done since 2012. We serve five of the institutions in the consortium. And we've run 15 of the 37 labs.

So, my name is Brenda Canine. I am the Great Falls College Lab Manager. And so, we haven't been up and running as long as Colorado has. So we started and got our internet connectivity right before fall of last year, so 2014. So we have-- these are the labs that we have run so far. So our clients have mostly been Great Falls College students, and then also our Flathead Valley Community College participants.

So we've done Intro to Microscopy, Mitosis and Meiosis, Histology, Cell Types, Membrane Diffusion, Hematology-- is when one we do a lot-- Parasites, Beer's Law, and Emission Spectroscopy. And so, since we've started we've had 505 lab activities. So we are pretty excited that we've had that many with only being up and going for a couple semesters now.

These are how our numbers have broken down. So we do big classes down to really small classes. So we are doing maybe a class that's only got a couple students in it all the way up to sections with 20 to 40 students each. We've been able to facilitate lots of different styles and types of classes. And now, Albert.

My name is Albert Balbon, and I'm the architect of the RWSL, which is the technology the NANSLO labs use for presenting their labs across North America right now. And I've been working in the CHEO project with Kodiak College to deliver classes to Alaska. And we've had great success with that. We've run through, I think, three different labs. Let me see if we got the right one here. So we use just our-- I've been only using the microscope lab to work to Alaska.

And we're sort of situated right here in between Denver and Alaska, which is pretty good. So we're on a small island there-- which is amazing because all this technology has happened off the side of my desk. So this is all grown from this.

And not only these labs, but I've also developed a dozen other labs during this time, usually in the area physics. I've been working with Dr. Suzanne Buie up in a Kodiak to deliver classes. We've been doing a lot in the area of Introduction to Microscopy. We also have done a Mitosis and Meiosis lab, and this has been really successful with the students there. Because a lot of them are in the military. And their times that they're available change quite a bit.

And, to give you an example, they may schedule a lab for a particular day in the coming month. And by the time that lab comes around, they may be posted someplace else in the world. And this has happened to me twice. So at the end of each lab, I would ask, OK, where are you located, so I can put a pushpin in Alaska. Because I know where Anchorage is and Fairbanks, but that was about it.

So I start putting Eagle River and all the different places. But couple students would say, OK, well, right now, I'm actually sitting on a beach in Hawaii-- and this was during the spring break. And another one was in Boston during a snowstorm. These are two students doing the same lab, at the same time with a student in Anchorage. And it was just amazing to-- the reach that we had there.

Other times I've had a student that has been transferred to Turkey. So there was one in Istanbul that we had and other ones were in Alaska. And just the reach of this-- if you have the good enough internet connection-- and we're talking that these students were doing the lab as if they were in a regular class. Because in my lab, I also have students come in to use the equipment. And I really focus on how they interact and compare them to the students that are online and how they interact, because I'm part of the conversation as they go through the lab.

It's different for the first lab, because the ones online are very apprehensive about using the controls because they don't want to break anything. But the second lab, they've used to it. They're very comfortable. Now they talk exactly the same as the ones that are local. You're always going to have the one person that wants to take control of everything. But, we tell them, OK, maybe it's someone else's turn to control the stuff at this end. But usually it ends up being one or only two of the students that are in the group that are going to control this.

One thing I would like to see is-- we do have career coaches that work with us, and that's been great-- but as I was mentioning early on, I'd like to see a mentor or like a Lab Tech 2.0, to use your term, that could be part of the conversation to help those students go through that lab that can answer the scientific questions that they have at that point. And I think they would be more successful at that, just for my personal observations on that.

I've also worked with Dr. Chris Hurley on Essentials of Human Disease. And so, we're comparing different diseases against normal cells. One of the things that the students have been using the images that they've been taking now for their desktop

images. Because they like the quality so much because of the high definition that they've been getting. And they realize that it's their picture. It's not one that they've just pulled off from someplace else. So they're using it themselves.

It's amazing that the interaction between these students-- I don't see there being any difference, right now. Here's an example of some of the fluorescent stuff with a little artistic license with Photoshop on there. That's some of the things that we've been able to do with our labs, too. And, I understand that these guys are going to be upgrading their microscopes to be able to do that capability.

And other things I've been working on is working with the school district to bring the technology down to the K to 12 level. And the way we're doing this is through some of the students real interest in LEGO and the LEGO robots. So we're allowing them to program at a distance, run the robots live, and be able to all watch as a group as this takes place from different camera angles. And we're given a lot of different options.

And right now, I'm working with our local school district to be able to maybe offer this in the fall for our whole school district, which would be a few thousand students and then across our province maybe after that if we get funding. Our provincial government has said last year that they would put up a building for me to house all of this. And we're going to find out in the next month or two if they're going to come through with this. They paid for an architect already. And we've worked with them to come up with a design for it. But they would house all of this type of stuff in British Columbia. So, thank you.

If you would help with my slides that would be wonderful.

Certainly.

I just wanted to mention, too, since Albert had mentioned some of the projects that they're doing-- oh, and Brenda didn't mention it, but they've got a Sim man. And we all know that the expense of Sim men are pretty expensive, often like \$100,000 mannequin. And then you program it to do certain things, like, I'm going to have a heart attack, and then the student actually works on that Sim man and determines what treatment and fortunately they don't kill the patient that way. So what we-- not what we, but what Brenda is going to do this summer with one of the faculty, correct?

Yes, Quincy and Albert.

Quincy and Albert is they're going to try to see if there's a way that we can deliver Sim man capabilities via NANSLO. So that a school that doesn't have the opportunity to purchase a \$100,000 mannequin can actually do that via NANSLO. So, I just wanted to mention that as Albert was mentioning some other projects.

So, let's talk a little bit about the scheduling system. First thing is, I'm going to talk about scheduling system. So, if you want to advance that slide for me, that would be great. This is at the high level. What do we capture behind the scenes so we can actually provide you with the opportunity to make a reservation for your students to perform a NANSLO lab activity at a certain date and certain time.

So to be able to do that, we have to do a bunch of things behind the scenes. For instance, review the parameters for the reservation that you've set up. So, what is the lab activity, what's the date, what's the number of students that are going to be performing that activity, and what are your team sizes, how many do you want to come into the lab at the same time to perform that activity.

Then we're going to, based on that information, we define the number of sessions that are needed. So if I've got 35 students, teams of five, I need seven sessions. So we're going to say to you, you need seven sessions, because that's the parameters you've provided to us. Based on that, we provide to you information about what blocks of time are available. You set a date range. And then, we say, OK, what's already booked, you can't reserve that. But what do we have available so your students can do it within the time range selected.

For instance, in that example, you would select seven sessions times. And once you've done that, and you book that reservation then we actually generate a unique URL and pin number. That is what you give to your students when that has occurred. Each of these reservations is associated not only to your course name and number, but also associated to your section ID and your faculty. So all of that takes place in the system.

Then the students come in based on that URL and password. And they see the blocks of time that you've allocated for that activity to take place. They then can select the time that they want to perform that lab activity that works for their schedule. On that date and time that they've selected, they come in to our reservation or our scheduling system, and we actually place them on equipment.

We also provide activity reports for you after the fact. As well as-- let's start with the appointment side, we give you a list of those students who've made appointments. So, if you have 35 students in your class, you look at your roster, you see what's in your system, and you see 20 have booked appointments. It gives you the chance to either remind them, you need to make an appointment or let them do what they need to do to fail that lab activity. It's totally up to you. But we give you the information. Then we generate reports so you know what has actually occurred after the fact-- did they actually come into the lab.

And we're also working on a financial transaction system. In respect to what is the reservation process for faculty, I'm showing you here we have unique dashboards for each role. So an institution administrator puts in some information. They could also make reservations on your behalf.

If you are going to make the reservation, we have a faculty dashboard that you would use to make that reservation, to access your reports, and to do some other things. So in relationship to the reservation process for you, you would select a NANSLO lab activity, you would select the course and section, that's been put in by your institution administrator, enter the number of students in the team size. You would select the date range. And you would also select the number of sessions needed. And then you would be given the unique URL and PIN number to give to your students.

And how do students access it? Using the URL and PIN number, if I'm a student that's coming in for the first time, I establish a scheduling system account. We generate a username and password for that. And in that process of establishing my account, I also next step into, OK, I've got a lab assigned. Here are the dates, what date works for me, and what's the best time for me to actually do that lab activity.

We also-- when the student books that appointment-- we send out an email to them to give them a lot more information about how to complete that lab. So we have a whole process here. The nice thing about it is-- we've talked a lot about lab technicians. We've talked about collaboration in these labs. Three things to do keep in mind when a student dials in to the lab activity often we either have a picture in picture or they're seeing the equipment. We have preset camera sets so they can zoom in to what's happening in the lab. And you have seen that when we went to the lab itself. So they're actually feeling like they're experiencing that lab.

The second thing is we give them a teleconference line to dial into. So when we talk about collaboration, they are, in fact, talking to one another. So, through this dial-in number that is how they are actually connecting as a team to perform that lab activity. They're talking to a lab technician. There's always a lab technician present to answer technical issues that they have. They're not answering pedagogical issues because-- pedagogical questions-- because that's you're instructions. But they're there to help that student.

And one other thing that I don't have on this slide but it's really cool, when they're doing the dashboard, everybody's seeing it. In a lab activity face-to-face, often one person's over the microscope, everybody else is waiting for a turn. When we're using the Control Panel, everybody is seeing it. And it actually enhances collaboration. You want to advance to the next one.

Student reports-- I mentioned this as well. This is just an example of what the student report would look like. We indicate who made an appointment, who made an appointment and didn't show up. So if you see that they scheduled a date and time, and then you look at the report after the fact and there's no data there, guess what, student never came in. Sometimes you'll see a date and time for attempted, but nothing else.

If the student came in on the date and time that they selected for the appointment, it may mean that they had technical issues. However, we often see that they came in early. They can't get into the lab early, because there's other students in there, just like any other assigned lab. So if you see an attempted and its two days before the lab took place and then nothing more, they never really came into the lab to do their activity. If you see attempted logged in, then you know not only did they come to get into the lab but they also saw the interface, they used it.

We also capture a logged out time. So if the student comes in and they spend 15 minutes in the lab, and it was a two-hour lab, well, you might want to have a conversation with them. Because they probably didn't do the work. However, if you see that it's a two-hour lab and they spend an hour and a half, log in, log out, it's very likely that they have done that work.

We also capture lab technician comments that come back to the individual student record. We can do it individually for that student or if there's a group of students and say, they did a really great job, got through the experiment, had great

questions, often our lab technicians will note that. And they distribute that comment among the team. So you see the individual record of the student, but it is actually a team response to that record. Advance the slide.

On the other side, it's all an integrated system. So we actually have another scheduling system at the laboratory that does things and connects into the primary system. So one of the things it does is it authenticates that student when they come in. So they've got an appointment date/time-- won't let them get on the equipment before then-- but if they come in at the right time, we authenticate them and we place them on a piece of equipment.

It also presents the appropriate NANSLO lab interface for that particular lab activity. It also provides the area for the technicians to input information about the students. And each night after the end of the day, we request data to come back to the main system. So they send that data back up to us so we can generate the reports for you.

So, it's really a highly-integrated integrated system. And it's working very successfully.

[MUSIC PLAYING]