Episode 53: Dr. Candice Foley & Nina Leonhardt

# KL: Katie Linder

# CF: Candice Foley

# NL: Nina Leonhardt KL: You’re listening to *Research in Action*: episode fifty-three.

# [intro music]

# Segment 1:

# KL: Welcome to *Research in Action*, a weekly podcast where you can hear about topics and issues related to research in higher education from experts across a range of disciplines. I’m your host, Dr. Katie Linder, director of research at Oregon State University Ecampus. Along with every episode, we post show notes with links to every resources mentioned in the episode. Full transcript and an instructor guide for incorporating the episode into your courses. Check out the shows website at Ecampus.oregonstate.edu/podcast to find all of these resources.

On this episode, I am joined by two guests. The first is Nina Leonhardt, Associate Dean for Continuing Education at Suffolk County Community College. Nina oversees a compendium of STEM-oriented programs for pre-college and college students. Most of these programs are funded by NEW York State Education, Labor and Health departments. Nina has over 35 years of experience in higher education and STEM. She earned an M.S. In Electrical Sciences from Stony Brook University.

My second guest is Dr. Candice Foley, who serves as the STEM Coordinator for all Suffolk County Community College NSF STEM Scholars on three campuses and the Principal Investigator for SCCC’s two consecutive National Science Foundation STEM scholarship grants, the National Institute of Health Institutional Research and Career Development Award grant, and the Long Island Community Foundation Removing Barriers and Strengthening STEM capacity at Suffolk County Community Colleges grants. Dr. Foley has also served on national grant projects involving curricular reform for chemistry education. Her experiences at the State University of New York at Stony Brook, Suffolk County Community College, and Brookhaven National Laboratory has enabled her to focus upon the adaptation and implementation of innovations in classroom learning and undergraduate research through curricular innovation and technology based software for the community college application. Candice has over 25 years of experience in both the research and teaching communities on Long Island and endeavors to bring her perspectives of each of these realms to her STEM students at Suffolk County Community College.

Thanks to you both, Nina and Candice, for joining me today on the podcast.

**NL:** Thank you.

**CF:** Thank you.

**KL:** So I actually saw both of you present at a conference recently and you were presenting on teaching research methods in particular, at community college settings and I just thought that this was really fascinating and I’m so glad that you can join me on the show. Why don’t we start out just by just talking a little about, did each of you have a philosophy for how you teach research methods?

**CF:** Well certainly Katie, thank you. I feel that at the community college, that we have spent so many years invested in these young people who are using us as a gateway for their career goals and aspirations, that research methods, of course, is extremely important and vital for their foundation because they’re not educationally or academically challenged, they’re just economically challenged. So the early research experience is for community college students has been valuable to their furthering of their educational career goals and aspirations.

**KL:** That’s such a great point Candace in terms of just putting extra tools in their tool kits as they move past the community college setting. Nina, what about you?

**NL:** I agree. See, our students yearn to learn and the idea of research is a little foreign to them when they come to us. So, it is our responsibility to add this tool to their tool kit and they get an opportunity to see research first hand and through a teaching course, we introduce them to the elements of research as related to the student.

**KL:** So you had mentioned this idea of students seeing research first hand which I think is so important, research methods as a topic can be kind of abstract. I’m wondering if you think there are particular challenges for students when they’re learning research methods.

**CF:** Well Katie, I think that the challenges for students are basically made of cognition. They don’t know what they don’t know about the topic yet. They’re eager to embrace it and find out. So, some challenges that we have are for the students understanding how to engage in participation and research and basically they also have to have an understanding on how to look at literature and to apply their methodology for the research collections and really the crux of the whole thing is to identify ethical issues that affect scientific research and how that applies to context. Here where we are regionally, we’re an island in the ocean, on Long Island and we have energy, health, and environmental things that we have tried to coalesce our research methods course around because of recent impactive climate change and Hurricane Sandy causing devastation on our coastal, which is basically all around us we’re only 50 miles wide. So, we also think that other challenges are to enable and enhance student’s ability to communicate science effectively with one another and an audience based on results that they achieved and this is also very important when we send them out to disseminate their results at conferences and meetings.

**KL:** It sounds like you have a really kind of holistic way of thinking about research methods. It’s not just necessarily formulating a question and choosing a research design but then also what comes out of that and what are the outcomes and how might you communicate that. That a really interesting point. Nina do have anything to add about the challenges for students?

**NL:** Yes. It is important to have students understand how to formulate good questions, not just research questions, but good questions. Something that they could actually attack and in this course they’re asked to do just that. So they have to formulate the question and then on the other end the importance of replication is discussed along with the other elements so they’re learning is very much tied to the research process so your notion that we are very holistic is very on target.

**KL:** I love that idea. So one of the things that you guys had mentioned was really that practical connection to what is going on kind of in your own backyard and really trying to help students to have a better understanding of real problems that are kind of geographically close to you. I’m wondering if you can talk a little bit about the kinds of activities, assignments or projects that you’re working with students to really help them understand kind of these very practical components of research methods including the kinds of questions that are really impacting the people around you.

**CF:** This, that is actually, this is the most exciting part of us connecting students to research in that when you have a contextual and regional connection is that students can see and develop a very close alignment with, with respect to where their sense of place is. That these projects and activities and assignments that we developed are directly related to that and when you see cause and effect and they feel like they can make a difference or that they are making a difference, or that things that they are studying will be something that other people in this area will be interested in and those things just go a very large way in helping us with creating activities, assignments, and projects. We have one now that we’ve used some grant money that we have available with us, interactions we have with other agencies, foundations and other grants. We try to leverage these resources and we’re doing some water testing here on the island that we have to do with nitrate from fertilizers. We also don’t have a very systematic sewage system here on the island, they’re addressing this politically and when students see that connection as well, it’s very interesting they feel like they can make policy changes as well. So their connection to these very basic research contextualizes experiences that we’re formulating their research experiences about now have really excited them and engaged them.

**KL:** It sounds like these kinds of really hands on and community connected projects that you’re developing are really also helping students to develop a sense of agency and kind of what role they can play with in their community or contributions that they can give back. Nina, I’m wondering if you have a particular activity or assignment or project that’s a favorite for you when you’re working with student teaching them research methods.

**NL:** Our students were also looking at how to make the campus more friendly to the disabled population and so they were using solar energy to heat bus stops for the disabled and also light the path floor. They identified the problem, came up with solutions, built the system, and installed them. So in that sense yes, they’re looking at not only how to solve a problem but how to solve a community problem which is something we’re very much interested in.

**KL:** That sounds like an incredible project for them to be working on. We’re going to take a quick break and when we come back we’re going to talk a little bit more with Candace and Nina about their work with research methods and in particularly, in the community college setting. Back in a moment.

[music]

# Segment 2:

**KL:** So Candace and Nina, one of the things that I think is really clear from both of the bios that I introduced at the beginning of this episode is that you have a real passion for teaching in the community college setting. I’m wondering if you can each talk a little bit about that. You know, why are you so passionate about in particular, teaching research methods so community college students?

**CF:** Well for me, the community college is an undervalued resource and the nations need to have more students engaged in STEM education and sometimes when students come to the community college, they don’t understand either their formal goal forward and we found that if we can connect them early with STEM opportunity and access and particularly with STEM research opportunities which in the decade or 15 years we’ve been collaborating inter programmatically here at the county community college with a wide variety of constructive convergences that we have going on here. We found that, that is really the key to enabling students to formulate more completely their goals and then to be connected with opportunities and people who can be transformational in their career aspirations.

**KL:** That’s wonderful. Nina do you have anything to add?

**NL:** Yes. It’s well documented that research is the key to student persistence in STEM field and our students have not had the luxury of experiencing the joy of discovery and the opportunity to provide them with that. Just the opportunity to enjoy discovery, to realize everything is not cookbook is just wonderful. I’ve taught at universities in colleges throughout the metropolitan, New York area and the community college students who developed so much just from that experience of discovery and they’ll say something. They’ll say “boy, this wasn’t in the book! And it wasn’t in any book and I got to discover it and in my lab this is what I’ve learned. It’s just so powerful and empowering that, I wouldn’t teach anywhere else.

**KL:** That sounds wonderful it also sounds really like students can kind of own what their learning and they can really feel like they’ve made an important contribution and what an interesting thing and kind of fun experience for them to have. So one of the things you kind of pointed out is that community college students are bringing kind of different sets of skills and experiences to the table for their education. What kind of important differences do you think there are for teaching research methods in the community college setting?

**CF:** Well, I think that there’s a couple of different things that we have with our population of community college students, particularly here at Passaic County Community College. We have a nontraditional student population they have to balance, their academics frequently with family and sometimes job scheduling all with the idea that they still have an aspiration to achieve greater things and to want to aspire to careers. So, what we try to do is to increase their self-efficacy in terms of knowledge of what potential and what can be available for them so that they can get engaged in these experiences and also because of the length of time that we’ve been doing this in the network of connections that we have. That they become kind of hooked on this once they get one opportunity, and that’s just been really wonderful in talking with our transfer institutions and new partners. We’re part of the State University of New York systems so we have near a connections as well to full year, our schools here in our region and they say that our transfer students when they come over to the full year schools are actually better prepared than their native students that they’ve already had because when we connect them here at the community college which we’ve got a heavy program of many, many internships that we promote and have the students aspire to. That when they get hooked on this, and that they get involved in a research internship and that they can possibly do two paid research internships before they leave the community college arena, they’re that much better prepared and engaged when they go to their full year institution and this also is really important because there a lot of paid research internships out there and again these students are economically disadvantaged so, to have a paid research internship over the summer to connect them with research mentors and peers that they will have for their entire career is really transformational for these students.

**KL:** That’s such an incredible opportunity too, for you know not only the practical skill development but the networking as you mentioned these are you know, students who are building relationships for their careers and what a great opportunity to be able to do that. What are some of the challenges that you’ve seen Nina, with teaching research methods in a community college setting?

**NL:** Well, as a follow up to what Candace said, we’re dealing with students that are juggling jobs. Not just one, also not just two very often three jobs.

**KL**: Wow.

**NL:** That they need to live and or support their family. They’re doing this while taking a full course load and now we’re going to go into research which is something that they’ve never done before. So it’s our responsibility to equip them with what they need to succeed. We know they can do the work, so that parts easy for us. We don’t have to spend a whole lot of time prepping them on whatever is they’re going to work on. But rather, their self-worth. The fact that they will be successful doing this and with providing this research method course online, allows them to take a course while they are in a research activity and still juggling their jobs. They are very adept at juggling jobs and taking courses. They could teach us something in that respect. But they don’t go into these research activities thinking that they are good at this. This is their first time. The first time that they are actually going to do research and we’re sending them to national laboratories or major universities or industries and they are a little bit unsure of themselves so we have to convey to them that they can do it.

**CF:** If I could follow up a little bit on that as well with what Nina said that challenges that we at the community college often have the resources in terms of financial equipment here on site that will enable us to develop research program here. So as Nina has said, we have a very nice connection to federal laboratory opportunities which offer paid research internships our students are competitive. They have to apply against a national pool and we have had a long history of having a large number of students achieve paid research internships from the west coast to the east coast down to the southern boarders and up to Canada as well and this is a challenge but it’s also transformational in that students who can be sometimes place bound when they’re offered the opportunity to engage in research in other arenas, it opens their world experiences and broadens their capacity to learn and also their fueling of capability within their selves.

**KL:** We’re going to take another brief break and then we’ll come back and chat a little bit more with Candace and Nina. Back in a moment.

[music]

# Segment 3:

**KL:** So one of the things that Candace, you and Nina mentioned earlier in our conversation was this development of a teaching research methods class online and this is something that had been developed through some of your grant work. I’m wondering if you can tell me a little bit more about that class and maybe some of the major components of it that are being built into that online platform.

**CF:** Well we have a online research methods course because of the need to connect an academic credentialing experience along with the contextual and the physical location of where our students are offsite during the summers and actually during the academic year sometimes as well in authentic research experiences not located at our college.

**KL:** I see.

**CF**: So, that is why we decided to make it an online offering and therefore, when the students are working in the lab, in usually a day time setting, they would have the freedom and the ability to have an academic credentialing experience available to them to suit their schedule.

**KL:** That’s a wonderful point of thinking about researchers who are just not on your campus and they may have been on your campus in the past. They may be you know more residential students but in the summers or during break time maybe they’re going into off sites spaces where they still need that curricular support. Nina do you want to add anything about this online course that you developed?

**NL:** Well it was an experiment on our part initially, so we looked at it as a pilot and we elicited comments from students after they completed the course and by a large, they loved the course. They loved the opportunity to be able to take the course especially when they were doing research and they stated that they better understood their research endeavor as a result of taking the course. Again, they’re first timers and so all that goes into setting up the actual experiment was new to them and as I had mentioned earlier, the fact that the results was not known by even the senior researcher was something that they had to gravel with and they understood it as a result of taking the course. So once we saw that it was well received, and it had value, we have continued to offer it.

**KL:** That’s such a great resource for your students. I’m wondering if you both can tell me a little bit more about when students have completed their research and they have some outcomes, what are some of the ways that they’re sharing those outcomes with other people within the academic community?

**CF:** Well, we have, we encourage our students once they have results and usually they have a poster presentation which is a compendium result and they have a research symposia which is the capstone congregation of all people who have been engaged in that and endeavored either in the academic year or the summer time. So once they have their poster ready we have many abilities to connect them to poster and research conferences that are both far and wide. The counsel in undergrad research has an annual conference, so does the Chemical American Society, so does SUNY. SUNY has a science undergraduate research conference, Columbia University has one, but our students have been out to the national conference on undergraduate research in Washington State. The challenge is just to get them the resources to actually take the trip because they are competitive in their application and so their chosen amongst other students who do research at other schools and so we’ve been able to get them in the arena and its just getting them to the arena is sometimes a challenge but they perform wonderfully and they have great communication skills. They network among their own peers at these events and then that just bonds their resources as well.

**KL:** How exciting for them to go out and be able to present their work. That’s such a cool outcome. Nina, do you want to add anything about that?

**NL:** Sure. Even in the New York State there are a multitude of opportunities and again our students are willing and it’s questioned as to how we get them to the locations and the far reaches of New York State, which is no easy matter. But they’re there and they’re there without us and they perform admirably. They both have been to the advanced energy conference which is a national conference that’s held every year some place in New York State. This past spring it was held at the Jacob Javits convention center in New York City and they presented their work there. Imagine being a young person and presenting your research at a convention center in New York City, how empowering again and their work is then presented to their peers so that their peers are also empowered and look to do research the following year. Right now we have a few students who have not yet gotten an internship opportunity for this summer and they’re contacting us daily. ‘Where am I going? What am I doing?’ of course we have a few things that we think might be applicable and they have applied but they want to go on they want to do research and they want to present and we do not have to convince them to present once they do it the first time. Not only do they appreciate the research and the joy of discovery, but they also appreciate the value of presenting and building their network as they develop professionally.

**KL:** That’s so wonderful.

**CF:**  If I could add a little bit too about the fact that once they, the students are research ambassadors of sorts, they actually can better speak to their peers and having the post-doctoral research scholars that we have through another grant, who are much younger than we are, applicant numbers here or programmatic directors, they have an ability to connect with near peers, we call them near peers the post- docs to our research scholars here, and that engenders this mentoring which is less threatening or it lowers the barriers for students, sometimes to go to a PI or a research director or somebody that they feel a little trepidatious but this mentoring and this ambassadorship and this peer to peer actually they weave a very tight fabric of connectivity of their own which empowers the students.

**KL:** So, I mean one of the things that I think sounds so wonderful about this group of students is that you know you’re creating this group that has these wonderful skills and then their going out into the world and you know what are some of the things that they’re doing post, you know, post SCCC when they’re leaving you guys? Are they continuing to be allies for research when they leave?

**CF**: Most definitely. The most exciting thing for us I think is, as program directors and grant PI’s is to, we have connectivity again via Facebook and social messaging and actually they just come back to see us and last weekend was a big weekend for graduation regionally and all over the country and I was on looking at my fledglings as you will and you see that students who have been with you over five years ago are getting master’s degrees in engineering and biology and physics at their four year institutions and we actually invite them to come back every year at the end ceremonies that we’ve been run concurrently for 10 years, and we have them speak to their peers and tell them that the benefits of what they achieved while they were here and how that can make a significant focus and a difference in their ability to achieve further financial support when they go to four year institutions or even job connections when they are ready to go out in the work force.

**KL:** Nina anything to add?

**NL:** We always have things to add here, one of our early success stories involves a young woman who went on to complete her education and then she came back to us and she’s now on our faculty teaching here at Passaic and so working on our grant funded programs. So she has come full circle and understands where our students are, as she was one herself and is contributing to curriculum development and evaluation in terms of how well the curriculum is meeting students’ needs and included in their needs is research.

**KL:** That’s incredible I think that clearly the work that you’re doing is so impactful for your students and you really are contributing so much to building up STEM researchers and student researchers in general. I want to thank you both so much, Candace and Nina for talking with me today and taking the time to share a little bit more about the work that you’re doing teaching research methods with your community college students. Thanks so much.

**CF & NL:** Thank you.

**CF**: It was our pleasure.

**NL**: Yes

**KL:** And thanks so much to our listeners for joining us for this week’s episode of research in action. I’m Katie Linder and we’ll be back next week with a new episode.

Show notes with information regarding topics discussed in each episode, as well as the transcript for each episode, can be found at the *Research in Action* website at [ecampus.oregonstate.edu/podcast](http://www.ecampus.oregonstate.edu/podcast).

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# Bonus Clip 1:

[intro music]

**KL**: In this first bonus clip for episode 53 of the Research in Action podcast, Nina Leonhardt and Dr. Candace Foley discuss their favorite resources for teaching research methods. Take a listen. I’m wondering if either of you have a go to resources or texts that you might recommend to other instructors, has there been anything that you found to be really helpful for your students as you’re teaching research methods.

**CF**: Well when we were first looking to create this course, we did it through literature survey and we fell upon one in particular called Practical Research and Design 10th edition 2013 by Paul D. Leedy and Jeanne Ormrod and it’s also available with online courses management tools and resources and we wanted to make this course available in multiple formats so we’ve also offered it online, we’ve offered it face to face, we’ve offered it as a hybrid course where they only come in to do data collection or the reporting out phenomenon as well. So that particular text has been really helpful to us for us to be able to be flexible in the way we format and offer this course.

**KL**: That’s wonderful. We’ll definitely make sure to link to that text in this show notes so that people can take a look at it and see if it may be of interest to them. Nina do you have any other resources that you want to share?

**NL**: Well we’ve also been fortunate enough to be part of a sencer program that’s Sencer and sencer strives to do just as we were talking about to provide this contextualized place for which to teach the science. And on the Sencer website, there are numerous resources and modules that instructors can use as models and incorporate into their own course work.

**KL**: Well that’s wonderful. We will link to that as well so that will also be a link in our show notes. Are there any additional resources that you guys want to mention for our listeners?

**CF**: Yes actually, there are some very good resources on the web. The American Chemical Society, ACS.org has a huge volume on resources for various grade levels, K-12, for community colleges for your colleges as well and also the council on undergraduate research (CUR) is a wonderful resource for people who are looking to develop research methods for research courses for their institutions.

**KL**: Awesome, thank you so much we will link to those also in our show notes.

You’ve just heard a bonus clip from episode 53 of the Research in Action podcast with Nina Leonhardt and Dr. Candace Foley discussing their favorite resources for teaching research methods. Thanks for listening.

# Bonus Clip 2:

[intro music]

**KL**: In this second bonus clip for episode 53 of the Research in Action podcast, Nina Leonhardt and Dr. Candace Foley share about some of their grant funded community college programs for training and research methods. Take a listen. So you’ve raised a really important point which is this idea of kind of resources, grants or otherwise that might help in particular in a community college setting in terms of teaching resources. Can you talk a little bit more about that, I know you have several funded programs that are directly tied to STEM learning and student training and research methods?

**CF:** Yes, we’ve been very fortunate because of the fact that we have engaged in programmatic, inter- programmatic collaboration here within our college both Nina and myself have a different range of grant based opportunities that we’ve early on said, well you know it’s probably better if we work together on this for our mutual population and as such as you have a little piece of something then it’s easier to sort of build on that and then it becomes sort of a growing avalanche and so we’ve been able to level our resources. We have scholarships for Science Technology, Engineering and Math from the national science foundation. We have back to back a decade of support from that agency. We also have a National Institute of Health, Institutional Researching Career Development award grant where in we’ll link post- doctoral scholars at the four year school to teaching mentors here at the community college and that’s actually how we first developed this introduction to online research methods course and utilized some resources at the full year school and the post- doc and we had meetings here at the college with our IT people and our interested parties interdisciplinary here and that was the way to get this course off the ground and then as Nina said, we also had the Science Education for Civic engagement and responsibility that’s an NSF grant which links the contextual content of today’s problems with the energy environment, help global warming, and give the students a definite contextual base to what they would like to research and to investigate. We also have a geo-prep and a Louis Stokes Alliance for Minority Participation and also Helmsley grant. So if I can say, and Nina will perhaps have more to say about this after this but when you have a little, if you can leverage it, it can help you gain more.

**KL**: I think that these grant opportunities like first of all congratulations, I mean that’s, it’s amazing that you’ve built kind of this network of resources and support but clearly this is something that can be very helpful to you as you’re building out and thinking in about how to create these resources to help your students. Nina do you want to add anything?

**NL**: Sure. We also have, we’ve been fortunate enough to have National Science Foundation grants and the Advanced Technological Education Trust, that have allowed us to develop more of the engineering programs and it’s from one of those that the project that I discussed earlier where the students developed the solar powered heating and lighting system emanated. So we’ve been able to use the ATE funding to develop curriculum and then provide opportunities for campus based research for our students. So that’s been great. We also have some Pipeline Programs that have been funded by New York State in which we’re working with secondary school students in much the same way than when we’re working with college students. So they are discovering the joys of research and when they enter Suffolk they are primed and ready to partake the role that we have here.

**KL**: Well thank you so much for sharing some of these resources and really just kind of the robust grouping of curriculum and programs that you’ve built for your students.

You’ve just heard a bonus clip from episode 53 of the Research in Action podcast with Nina Leonhardt and Dr. Candace Foley sharing about some of their grant funded community college programs for training and research methods. Thanks for listening.