Higher Ed Rewired
Season 1, Episode 4
Neuroscience Lab Driving Student Success Beyond the Undergrad Experience
Host: Oliver Wong
Guest: Dr. L. Mark Carrier and Dr. Larry D. Rosen

Undergraduate students at Cal State Dominguez Hills participate in meaningful experiences ranging from observational studies and laboratory experiments to biomedical and psychophysiological research. Students work closely with faculty mentors in the neuroscience lab partnering on scholarly writing and research. The program has been successful in increasing the aspirations of students towards careers in research and enrolling in competitive graduate programs across the nation.

Dr. Larry D. Rosen, California State University, Dominguez Hills, Professor Emeritus of Psychology and Co-founder, George Marsh Applied Cognition (GMAC) Laboratory

Dr. L. Mark Carrier, California State University, Dominguez Hills, Professor, Psychology and Co-founder, George Marsh Applied Cognition (GMAC) Laboratory

OW:
Over the last few years, a pair of California State University professors have made news far beyond their Dominguez Hills campus.

AX - POST AND FADE UNDER
Collage -- news stories
BBC: "Larry Rosen is the author of the distracted mind"
Couric: "We're going to meet the top experts on tech addiction"
Couric: "Come here Dr Carrier come to mama, let's do this thing."

OW:
Mark Carrier and Larry Rosen co-founded a research laboratory with Nancy Cheever - to study the intersection of technology and the human mind.

AX - news collage 2 - POST AND FADE UNDER
Cooper / Rosen: "Is it known what the impact of all of this technology is? Absolutely not. We're all part of this big experiment."
Carrier: "It's interesting because with this technology even if you don't feel you had to work harder, it can be shown in the data."

OW:

The professors in this lab are also leading the way in teaching undergrads how to become researchers themselves. Many students come in with bachelor's degrees in mind -- Carrier and Rosen help them aim farther -- turning them into successful masters and doctoral students.

AMBIENT SOUND - post and fade under
"So let's introduce ourselves, I'll start I'm Mark Carrier, I'm a psychology professor. I'm Dr Cheaver."

OW:
Much of this transformation happens in a windowless room with a conference table at its center.

AMBIENT SOUND - joining lab - post and under

Mark Carrier: "*Today we have a couple of students who are interested in maybe joining the lab here visiting today."*

OW:
The concept is simple: create an inviting, collaborative space where undergrads participate in serious research -- right alongside accomplished Ph-D's.

This is how former Dominguez Hills' student Andrew Luu experienced the lab.

AX - Andrew - impactful
AL: this lab is one of I think no it's actually the most like impactful thing that has happened to me

OW:
Andrew's parents are immigrants from Vietnam. Like many other students in the CSU system, he's the first in his family to attend college. The lab didn't just give him research experience, it also guided him towards grad school -- even helping him with the G-R-E -- the standardized exam that many grad programs require of applicants.

AX - Andrew - mentors
Andrew Luu*: "they constantly encourage you. They constantly believe in you support you. And then the students themselves past students current students new students they all work to support each other. And so it just becomes like an uplifting space that really just really encourages you."*

OW:
Now, Andrew is starting a PH-D program.

Carrier says they're using the research lab as a tool to mint more Ph-Ds by both engaging students in high-impact practices meant to help them towards graduation as well as mentoring them on how to think long-term about their academic career after graduation.

AX -- Carrier - give an edge
"many of these students really you don't really know what they're gonna do. They don't know what they're in for in terms of their careers or their long term interests. And they needed a place to find that out. So we wanted to give them that space and to prepare them, //// to give them a little bit of an edge"

[THEME MUSIC]

OW:
On this episode -- a research lab that's about much more than research… I'm Oliver Wang. This is Higher Ed Rewired.

[POST THEME MUSIC]

[PROMO]

SEGMENT A

OW:

Welcome to Higher Ed Rewired. I'm Oliver Wang. Professor of sociology at California State University, Long Beach.

70 percent of students who attain PH-Ds have at least one parent who graduated college. Education research has affirmed, again and again, that having older family members who've gone to college themselves help the next generation navigate their own way through higher education. [1]

So what about *first-generation* students then -- the first in their family to attend a four-year college. Who do they turn to when they need to figure out the complexities of getting to graduate school?

Larry Rosen and Mark Carrier pondered the same thing when they began their careers at Cal-State Dominguez Hills where more than two thirds of the students are first generation.

[1] https://www.nsf.gov/statistics/2016/nsf16300/digest/nsf16300.pdf

AX - Carrier - know nothing
[00:00:00] Imagine students at least in psychology who don't know what they want to do. They've taken a few classes and they know they're interested in research. They're not aware of the career opportunities. They're not much aware of the path that it takes to get to those careers like going to a graduate program. So they basically know nothing.

OW:
That's Mark Carrier. The solution he, Larry Rosen and their colleague Nancy Cheever came up with was a novel one.

They created a Tier One lab -- a designation meaning it conducts the most rigorous research. However, their lab was also designed to mentor promising undergraduate students by having them work side by side in the lab with seasoned faculty.

Larry Rosen picks up the story from there.

LR: what this lab really added was a sense of. This is what a Tier 1 lab would look like when you go to graduate school. This is what you will get. You will get mentors to work with, you will get instruction in a variety of areas that we're happy to tell you. Mark and I both went to a Tier 1 graduate school and had a good lab experience there and wanted to try to recreate it so that our Dominguez Hills students could not just succeed but excel all our expectations and theirs also.

OW: the kind of setup that you have does seem as is to your points consistent with what you might find at a large research university at the graduate level. And it was a priority for you all to provide something similar but for undergraduate students and I don't know how common this would be. At other undergraduate institutions around the country. But that does seem to be something that again bringing kind of a graduate level set of resources and experiences but establishing that for the kind of student base that we work within CSU's which is primarily undergraduates. Why was that so important to each of you.

MC: Well it's important to me because not being part of a PhD program but rather teaching in the CSU and not having access to a lot of graduate students in order to perform in my profession at the level that I really want to I need to have that set of highly trained students around me. And the only way Larry and I could imagine doing that was by building something that replicated the experience that we'd had and rapidly trying to bring those students up to speed to facilitate our own research.

LR: right and one of the things that I think is really important to add onto what Mark said is that not only did these students not really know what a research lab's about but not even sure that most of them coming in have any kind of built up expectation of what it is to be a graduate student. And our goal has

always been to have each and every student apply to PHD programs and hopefully get into PHD programs. But as Mark said our students are kind of at a disadvantage here because they're there are not a lot of CSU research labs and there's not a lot of training going on in how to be a good graduate student. And we would always reiterate when we started the academic year that // the expectation is that they would come in and work. And I think that that that is difficult for many CSU students who are mostly commuters. We have a small set of dorms but most of our students are commuters and really don't have any idea about what it's like to sit in a lab all day and when you have two free hours instead of going and getting a sandwich and eating in the cafeteria going and getting a sandwich and bringing it back and eating in the lab and there's a lot of hanging out that goes on which is also really important I think from a socializing point of view to get those students to recognize that yes a lab is a place that you go and that you thrive.

OW:I'm wondering if you can describe what were some of the key things that you knew you wanted this lab to be able to do in regards to giving these students perhaps a different set of skills that they might have had, you know, prior to the existence of something like this.

MK: One thing that we wanted to get going on rapidly was having students become co-authors on research publications. And that is not an easy thing to do. The students come in with varying levels of skill in writing. We realized that in order to make that happen, we had to give explicit instruction in writing. And so we do that every academic year. We have a few lectures where we basically review how to write scientific research and a lot of different formats. We provide that. We know they're supposed to get that in their classes, but in order to elevate their skills, we need to give them that extra instruction. So there were a whole set of skills like that that we realized we needed to actually teach our students and hold them to high standards, hold them accountable for doing a good job at those things in order just to have them be co-authors with us.

Same thing with writing a personal statement. Mostly students had no idea what a personal statement was. And you have to write one in order to apply to graduate school. And one of those areas was statistics.// what they don't typically get are the kind of statistics that are used in the kind of research projects that Mark was talking about, which are tend to be pretty high order statistics. We would call them multivariate statistics. And so we realized that was really critical. So we have lots of meetings where we will take a statistic, we'll take a dataset and show them how to do that statistic on the dataset and then how to interpret it and even how to write it up in a results section in APA style.

SEG B

OW:

That's Dr. Larry Rosen at Cal State Dominguez Hills, who, along with colleagues Mark Carrier and Nancy Cheever, created G-Mac… or The George Marsh Applied Cognition Laboratory,named after a venerated former professor on campus…

[Ambient Sound] - post - and fade under
"So I have a couple of announcements"

OW
Recently when we caught up with them at the lab, they were saying goodbye to students headed to graduate programs.

[AMBIENT SOUND]
"I'm going to miss your laugh"

OW
Dr Nancy Cheever is talking to Amarantha [ah-mah-ran-tha?] Ramirez… She's headed to a ph-D program in San Francisco.

AX - Amarantha - post and fade under…
"I want to thank everybody, all of the professors, all of the students and everybody in this lab who shaped my experience so greatly at this school. It was honestly the most fun I've had at a school like the last three years were amazing."

OW:
Amarantha is a first generation student.

As she tells it… when she first started college, she didn't know anything about how to get to grad school. The lab is what helped give her direction.

AX - Amarantha - navigate
"Some of the more complicated steps of the process were knowing what to put in your CV your curriculum vitae what to put in your //personal statements because there are things that you shouldn't put in there you know saying oh yeah I have depression or I had all of these experiences in life and why they make you seem like you know a person.
Not everybody wants to hear about that and I didn't really know that. I wasn't sure like a personal statement sounds like you know you're talking about your life or something. No that's not at all what it is it's like low level bragging about your accomplishments really. //
So one of the biggest things that this lab gave me was a way to navigate further education.

OW:

So how does a research lab accomplish this? How does it take -- as Amarantha put it -- a “lost” student… and create a confident, experienced Ph-D candidate?

That’s where we pick up our conversation with Doctors Rosen and Carrier.

Mk: “we have a shared space so we cram everybody into one large room. So we have actually four Phd level mentors and anywhere from eight to 10 undergraduate and graduate students where we meet in there with workstations and then we also have a an experimental room where we have some of our specialized equipment like our brain imaging device which is much smaller and just designed for recording data from subjects.

LR: And we set up the main room to basically foster conversation between our students so there's a big conference table in the middle and there's a wall that they can write on with dry erase pens and we have a projection system so we can project on that wall and teach them statistics or discuss things have presentations

MK: and I want to add the room with designed specifically for a purpose. The original idea that Larry and I had was to put faculty right next to students working throughout the day. So everything is done with that kept in mind. So we have hard workstations along the wall accessible to all. We don't put dividers up between them. We want people to interact. We want the faculty to interact with students. We have the conference table for meetings we sometimes have a meeting's going on at the conference table while other people are on workstations working together. It's all about interaction.

You don't just train students on research methodologies or experimental techniques you also do what you might describe as life or job skill training such as how to be mock interviewed how to write a cover letter. Why were these so essential to including as part of your curriculum.

The real goal of trying to get students into PhD programs -- some of it is driven by that. You have to be able to write a personal statement. You have to be able to create a CV something that's gonna be scrutinized by professors at top institutions. So because that was our goal we had a whole list of skills we knew we had to focus on. But then we're also gradually thought further about careers and what we can do to help students succeed after they leave the lab. So, for example, we do have a workshop every year on your web presence. What they can do to make themselves look good online if someone googles them and how to parlay that into helping them achieve their career academic goals. So slowly over time our number of skills we teach average has gotten really large and it's because of these long term goals that we have for the students.

If the student wants to join this lab how do you determine who's ready for that level of work. How do you make that determination of who gets invited in.

Well I think the first step is we get a recommendation about a student and it usually comes from one of us. One of the mentors or we have some X Lab students who are teaching part time classes in our department who also recommend students and then we give the student a chance to try it out meaning they come to the lab meetings. We have two lab meetings a week Tuesday and Thursday and they come to start coming to the lab meetings and just being part of the lab meeting participating encouraged to ask questions encouraged to get involved and then we discuss is is there anybody who's willing to mentor the student. That's the key. You can't just come into the lab and be part of the lab you have to be part of the lab mentored by one of the mentors in the lab. So if nobody is willing to step up and say I'm willing to mentor this person then that person is not going to make it in the lab. but usually if the students get that far where they get a tryout almost always they're that good of quality that they end up in the lab.

SEGMENT C

OW: I'm wondering if each of you might be able to share an example of a student that you've worked with that has really flourished from the experience having worked with you all in this lab?

MC: I'll give an example of one of the students that we had. Her name is (unintelligible). She had gone to a very bad high school. She'd had some real problems with her family. One day she came up after class and approached me and she said I would like to get some research experience. So we did the usual tryout. She came to the lab. She did fine. After three years in the lab she not only carried out her own project, she co-authored research in the laboratory.
She ended up getting into a master's program and now she's a professional in the field of psychology and I'm super proud of her.

LR: and I'll give you my favorite example I was teaching a behavior modification class and there was this this young man Alex who sat in the front for the whole semester didn't say a word but just sat in the front row at the end of the semester he came up to me and he said I listen to you all semester What is this research stuff about. I had no idea I had no clue. And I said well once you come sit him in the lab and see what things were like and he became by far one of our best students ever. His name is on several publications. He's finishing up his page now at Iowa State. He'll be an amazing professor. And this was all just from a kind of a oh I'm in your class. What you do what you're talking about sounds interesting.

OW: Those are both fantastic examples really exciting. ///
I assume like any good experiment there was some degree of trial and error in getting the lab to where it is today. So can you talk a little bit about those early years in the kinds of lessons you learned along the way in trying to put this together?

MC: The first thing that comes to mind is the selection of students for the lab. We have had amazing students but we've also had cases where there just wasn't a good fit and we didn't recognize it at first. So we did have to tinker quite a bit with the process of who would be appropriate for the lab what kinds of

skills are necessary to do well in the lab. Looking at soft skills like how they get along with other people and so on and evaluating that better. So we we've done that and that's always undergoing revision. And the other thing that comes to mind for me is the Jerry prep we never really wanted to be the people that teach our students how to do well on the Jerry but we learned very quickly that our students without any extra instruction that's gonna be one of their weak areas of application to graduate school. So we took on that.

OW:So for other educators who might be listening to this what advice would you give them in terms of the first crucial steps to take in setting up a similar student centric kind of project that you all have running right now.

MK: Well in reflection I think the space is critical. Creating the space arranging the furniture having the right equipment to make it useful to students is really important. When we first started the lab it wasn't like everybody carried laptops around like they do today. We put in a high capacity printer for many students having access to a printer is an issue. We gave them resources that would make them want to be there and working in the lab. And we even told them use the printer for your other classes. You know come in and work on your essays but be there in the lab and be around other people so part of it is just the actual physical equipment that you have. They're all designed for this larger purpose.

LR: If you're going to start your lab start it with a colleague. Don't go it alone. Started with a colleague merger two groups together and come in with a common goal. Our lab is known for our investigations of the psychology of technology. Find a moniker or find a branding mechanism to brand your lab such that it has it has a meaning and it has value that way. And that starts I think starts you off in the right direction.

OW: You all have been doing this for a decade now and I'm wondering given the length of time what sustains your commitment and interest in this.

MC: Well it's just naturally interesting to me. I love the topic. I've always been interested in computers my whole life. Not from a psychology point of view but once I got into psychology it was easy to meld the two interests and then the other aspect for me is seeing the students succeed. It's a wonderful feeling.

LR: and then for me the real goal has always been to mint a bunch of Phd's who are gonna create their own little g Mac labs all over the place and we're already starting to see the fruits of our labor and the students from the very beginnings of our lab. We're starting to end up getting their p d and getting their their workspaces and their labs together and oftentimes during the during a semester during the school year we'll have one of them Skype in and talk to the students about what their experience was like being in the G-Mac lab and what their experiences like getting their PhD and what kind of advice they have. I would venture to say that most of our students never dreamt that they would go on past a bachelor's degree. I think very few of our students have gone on for page two of thought that they would get a PhD

and I think this lab is really kind of stimulated them into raising their expectations and that to me is very exciting.

OW: That's doctors Larry Rosen and Mark Carrier of Cal-State Dominguez Hills.

One of their recent graduates turned Ph-D candidate is Andrew Luu… We met him at the very beginning of this episode.

[THEME MUSIC]

AX - Andrew - In the beginning
"in the beginning if you spoke to me about PhD doctorate level work being a doctor or going into a doctor program I would've thought you crazy like that's way out of my league way to advanced. I can barely get through my intro courses in chem or something. But through this process you're thrusted into an environment where you're, you have to learn new things you have to learn how to figure things out. Problem solve.
And you work with mentors and they help you, But you're constantly going through this process where you're learning independently while you're learning with them. And so it really gives you a new kind of profound sense of like confidence and understanding that just because you know you're not ready or you're not able it doesn't mean you should let that stop you from you know engaging learning and participating. And then, through the kind of engagement, through the learning that you do, you'll eventually be ready."

OW:
Andrew Luu is now a ph-D candidate at Auburn University in Alabama.

[THEME MUSIC - POST AND UNDER]

OW:
And that's it for this episode of Higher Ed Rewired. If you liked what you heard, please subscribe to our podcast and review us on your favorite listening app. Details on our website - Higher-Ed-Rewired-dot com.

OW:
From sunny Long Beach, California -- I'm Oliver Wang… and for all of us here at California State University -- thanks for listening!

[MUSIC POST - AND OUT]