

## **STEM research program attracts top young minds to Seminole State**

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Dr. Maya Byfield (from left), professor of Biological Science at Seminole State, oversees the STEM program that pairs students, such as teenage siblings Nikhil and Sapna Patel, with leading researchers.

What if doctors could detect Alzheimer's disease years in advance, simply by using an iPad app? What if lifelike avatars could help autistic children improve behavioral and speaking skills?

Teenage siblings Nikhil and Sapna Patel are setting out to find the answers through an honors-level STEM research program at Seminole State College of Florida. The program is giving Nikhil, 15, and Sapna, 14, the opportunity to conduct work alongside leading researchers.

"The opportunities you get at Seminole State open up a lot more doors than you'd get as a regular high school student," says Nikhil, who attends Oviedo High School with his sister. "Being in the course enables you to email a professor and ask about conducting research together. It gives you a much higher status and allows you to pioneer your own field of interest."

From the time he was in elementary school, Nikhil has been fascinated with the brain. "When my grandmother died of Alzheimer's two years ago," he says, "I decided to commit myself to making sure no one else had to suffer."

So Nikhil created an iPad app for early detection, testing it on people with Alzheimer's vs. those who have not been diagnosed with the condition. The early results have been promising, and he's now working with Dr. Charles Hughes, a professor at the University of Central Florida's Institute for Simulation and Training, to gather more data. Nikhil hopes the app will replace MRIs as the primary way to diagnose a neurodegenerative disease that affects 5.3 million Americans. Nikhil's findings were published in the September 2014 issue of the International Test and Evaluation Association Journal.

Sapna, 14, wants to become a research veterinarian. As a young child, one of her first projects catalogued what time of day butterflies eat the largest amounts. Recently, Sapna gave "one of the best presentations I've ever seen," says her professor, Dr. Maya Byfield, who oversees the STEM program at Seminole State. The presentation was on WUBeeS – a technology pioneered by Dr. Darin Hughes as a way to measure empathy-oriented behaviors.

Now, Sapna is gaining experience as part of a project with Dr. Hughes and other UCF researchers. Their computer-generated avatars are helping students with autism to read non-verbal clues and feel empathy, which enhances how they relate to others.

"I hope to find results like that in my experiments," Sapna says. "One of the students even asked the avatar out on a date!"

Seminole State's STEM research program is broken into two semesters. The 1-credit-hour introductory course offers a basic understanding of the scientific method. A 3-credit-hour class, held during the following semester, pairs students with researchers.

"We're trying to build a biotechnology industry here in Central Florida," says Dr. Byfield. "But in order to do that, we have to get young people intrigued with the sciences. For us to move forward and think of new ideas, STEM has to be more than a buzzword."

Students in the advanced course this year have held internships with the Sanford-Burnham Medical Research Institute, Stetson University, and the University of Florida IFAS Mid-Florida Research and Education Center. Byfield says her students are competing with juniors and seniors at top universities for the internships.

When the program started in 2009, it was first of its kind in the Florida College System. Over the past five years, enrollment has doubled to about 20 students – about a quarter of whom are high school dual enrollment students. Neel, the Patels' 20-year-old brother, an alumnus of the program, is now studying computer science at Harvard University. In 2012, he placed sixth in the Intel Science Talent Search, considered the most prestigious competition for high school students.

"I love when my students reach outside the box and perform well," says Byfield, who sees herself as a bridge between innate talent and real-world opportunities. "That's my great reward."

The Grindle Honors Institute offers programs for students who want to enrich their academic experience and engage in honors activities at Seminole State College of Florida. For more information, [please visit the Grindle Honors Institute homepage.](#)