

*Testimony - Joshua R. Tagore, University High School of Science and Engineering*

Good morning. Senator Alexander, Senator Dodd, esteemed members of the Subcommittee on Education and Early Childhood Development - I am Joshua Tagore from the University High School of Science and Engineering, in Hartford, Connecticut. First and foremost, it is an honor to meet you all, and to represent the University High School of Science and Engineering. I am proud to be part of the effort to help make our country more competitive in the fields of science and mathematics. I am here to testify on S. 2198 - the Protecting America's Competitive Edge (PACE) Act.

Let me begin with a bit of personal background. I attended parochial schools and mainstream public schools through the 6th grade. At the end of the 6th grade, my parents and I made the difficult decision to leave the Avon Public Schools - one of the finest school systems in Connecticut. I enrolled at the Hartford Magnet Middle School to take advantage of the benefits of the magnet school's unique approach to education. I spent 7th and 8th grade under the guidance of principal, Delores Bolton, and a strong and dedicated staff of teachers of the very highest caliber. During my time at the Hartford Magnet Middle School, I gained a stronger love for mathematics and science - two of the school's areas of specialty. While in middle school, I participated in two statewide science fairs and the citywide science fair. My participation in the City and the State Science Fairs helped to fuel my love for math and science. I was also afforded the opportunity to participate in the Connecticut Pre-Engineering summer Program (CPEP). Upon leaving middle school, my parents wanted me to attend a school that could accommodate my growing interest in math and science. My pursuit for knowledge in the fields of science and mathematics was met when I enrolled at the University High School of Science and Engineering.

I am currently a sophomore at University High School, a high school affiliated with the University of Hartford. My experience at the High School for Science and Engineering has afforded me extensive exposure in the fields of science, math and engineering. Since being accepted to the school almost two years ago, I have gained an extraordinary amount of knowledge, and can say that I have participated in classes that the typical high school sophomore does not get the opportunity to experience. Some of the opportunities

that were made available to me include: course work in Physics and Engineering as a freshman; and Advanced Placement Biology as a sophomore - which is a course designated for juniors and seniors in high school. The class schedule is designed to be similar to that of a college student. We take all honors courses, and are offered four possible math based courses as freshmen (Algebra or Geometry, Algebra 2, Integrated Math, as well as physics and engineering).

Another benefit of being enrolled as a student in this extraordinary learning environment is being surrounded by teachers who have a tremendous amount of insight, experience, and knowledge about what they teach. Students are challenged to think analytically and pursue learning vigorously. To quote one of my fellow students, "The University High School is a place where all students feel free to be smart and share with others their passion for math and science."

My journey over the last two years has allowed me to travel an incredible road that has offered me greater knowledge and experience. The most recent benefit of my magnet school experience was an independent study summer internship at Trinity College - a non-curriculum experience facilitated by my Principal, Dr. Betty Colli. This incredible experience was birthed in a most unusual manner. Almost every week, students are exposed to career professionals in the areas of science, mathematics, technology and engineering. It was through one of these weekly presentations last school year, that I learned of a summer research program, on the campus of Connecticut's Trinity College, which was open to high school students. After expressing a strong interest in participating in this program, my principal, Dr. Betty Colli made arrangements for me to be interviewed by the program coordinator, and then finalized the arrangements for me to participate in the internship. This gave me the opportunity to work in a college styled laboratory as an intern, among college students who were in their Junior and Senior years.

In the summer of 2005, my fellow researchers and I studied an area of the brain called the hippocampus - the area which is responsible for learning and memory. I walked into this

program having very little knowledge of how the brain worked. As a result of participating in this internship, I gained an extensive amount of knowledge on how the brain functions. I learned how the brain sends signals, how those signals are received, and how the signal makes a person perform an activity. I learned that the brain is composed of cells called neurons - that neurons consist of structures such as a nucleus - the control center or brain of the cell, an axon - which sends information to other neurons, and a dendrite, which receives information from surrounding neurons. I learned that all neurons are not the same - that on the brain - there are different groups of neurons, each specializing in a different task, such as processing language or helping to coordinate movement. I learned that neurons communicate by a process called synapses, where there is space between the cells to communicate. I learned that in synapses, there are four phases, Pre-Synapses, Synapses, Post Synapses, and Post-Post Synapses. I learned that in pre-synapses, the message, sent in the form of what is called a neurotransmitter, travels down the axon. I learned that in synapses, the neurotransmitters are sent into the fluid between the two neurons, known as the synaptic space. I learned that in post synapses, the neurotransmitters are sent to a specific area on the receiving neuron, releasing the message in the form of sodium and potassium. I learned that in Post-Post Synapses, the neurotransmitters are either destroyed by cleanup cells known as glial cells, as well as enzymes, or they are recycled by the axon. This is just a small sampling of some of the knowledge that I acquired during my summer internship experience. If your head is giddy from all that detail, my head is giddy at the thought of learning more of it.

In addition to gaining extensive knowledge about the brain, I became very familiar with the research environment on a college campus, thanks to the tremendous influence of my research colleagues and our professor. From these individuals, I learned that before you enter college, you must establish a good work ethic. I learned that such a work ethic entails acquiring effective time management skills, showing up for whatever you are doing on time or even earlier, and that you must prove to be dependable in a fashion that benefits all of your fellow colleagues. The college students and the professor that I worked with always took time out to help me whenever I had a question about the brain,

or our research, no matter how busy they were. In fact, they always encouraged me to come to them with questions.

This summer experience made a tremendous impact upon my life. Not only did I learn about the brain and the proper work ethic, but I also gained first hand experience on what could possibly become my future career interest. As a direct consequence of my magnet school experience, I am currently considering career interests in the fields of Bio-Medical Engineering, Neurosurgery or Cardiology. I have always had a strong interest in studies of the human body, and after taking part in this internship, my appetite for a career in a medical field has increased significantly. Having been shaped by my summer experience, I am interested in pursuing this course of study when I get to college.

I strongly believe that if there are more schools like the University High School of Science and Engineering, our country will see an increase in the number of students who will go on to pursue careers in science and mathematics. One of the things that I have learned since attending this school is how mathematics and all three areas of Science - Physics, Chemistry, and Biology - are related, and play an important role in our everyday lives. Having this experience has been one of my motivations to working towards obtaining a career in the fields of science and Engineering. My increased exposure to mathematics and science has motivated me to help make my community and my country a better place to live in for future generations. It is important to instill this within the minds of every student across the Nation. It is important that every boy and girl across the Nation know of the benefits of math and science. The University High School has been aiding that cause since it was established two years ago. Currently, of the two-hundred students, sixty-four percent of them are boys, while thirty-six percent are girls.

Two hundred students at University High School in Hartford is a start, not a final destination. I believe that if more high school students are exposed to this kind of unique learning experience as a routine part of their high school careers - as I was in my freshman year - we could help to shape a nation of young adults who will gain an interest

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in careers involving math and science. In this new millennium, the future of our Country depends on it. Thanks for your attention - and again, it has been my honor.