

Supporting scientific talents at Al Nayzak for Supportive Education and Scientific Innovation

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Since physics is life's fruit, mathematics is the main course, and technology is the carrot that attracts attention, our main slogan at Al Nayzak is "Science is not just for scientists." It is for everybody and it is all around us. When we walk, we push the ground backward and the ground pushes us forward. (That's how science works!)

Out of this way of thinking, we came up with Al Nayzak; let me tell you why we chose the name. First of all, it is a beautiful name that has been attached to science and physics. When a meteor hits the earth or any other planet, it creates a new reality and changes the topography of that planet. Numerous studies have shown that a giant meteor hit the earth over 50 million years ago and caused the dinosaurs to go extinct, allowing humans to prosper on our planet.

At Al Nayzak, we view the official implementation of projects and programs differently. All programs start with thinking. In Dr. Abdalla Al Najjar's talk at this conference, he presented the question "Do we want science or innovation?" I agree with those who say that, at this point, we need innovation rather than the specific, complicated details of science. I agree with the following quote attributed to Einstein: "Everything should be made as simple as possible but not simpler." We need great investment in science, and critical and creative thinking, but for the time being, in order to mesh with the Arabic situation in science, we need to focus on investment in supporting entrepreneurship and scientific innovation. Without a process to support innovation we will be stuck in honoring innovators and expect to "harvest unique fruits of a non-existent tree." We try to avoid this. I remember the famous story of gravity, according to which Newton was sitting under a tree and suddenly discovered the general law of gravity. No one really knows if the story is true, but we know that he spent long years involved in research before he actually made his discovery.

At Al Nayzak, we always start with playing and then we move to thinking. Playing games that motivate thinking can stimulate curiosity; curiosity in playing and learning leads to new ways of thinking and represents the systematic, scientific way of doing things.

The truth about our official education system in our Arab countries is different, unfortunately, from Al Nayzak's methods. Students in the general Arab education system are given appreciation and honor in accordance with the grades that are encrypted in their certificates, not according to what and how much they know.

When I finished high school, I took the Tawjihi (the general secondary examination in Palestine) in the vocational stream. I scored 100% in physics and 98% in mathematics, and I barely passed the other subjects, so no Arabic university accepted me. What saddens me is that today, after 20 years, this limited policy of Arabic academia is still as it was. No Arabic university will accept a student to study engineering or medicine if that student is good in one or two subjects but does not have an extremely high Tawjihi average.

As things turned out, I was accepted into one of the best international universities, and after my first semester I understood our real problem. Perhaps it is that our universities are being superficial when they look at students, or perhaps they are being lazy as they search for only the best students; that may be why we take the easy way out and rely on grades or socioeconomic strata.

Our Organization's Programs

Young Researchers:

We started this program five years ago in eight different cities. There are now 980 young researchers aged 14–17 within governorates from the north to the south in Jenin, Nablus, Ramallah, Bethlehem, Gaza, and Jerusalem.

Each year, we have 12 research topics: 6 in social science and 6 in applied science. The program works over three years. Whoever sees the announcement for it in the newspaper and contacts us may join the first year. We usually take 1,000 youths at the beginning of the year, but end up with 200–300. We accept students on the basis of their willingness to participate; each one who is interested in joining has an equal opportunity to join.

Each day, about 5 to 10 parents come to us, believing that their child is talented, and they are so sure of it that we almost dare not say that they are mistaken. We all see our own children as talented. But the main question is “Who is really talented?” And who among the parents would be willing to pay the price of innovation?

We try to support our adolescents in their research into the 12 topics until they form a research question. If the student is investigating tomatoes, for example, he or she has to plant two tomatoes, one the organic way and the other the ordinary way. Then he or she has to observe both tomato plants, make the necessary assessments, stabilize the variables that are supposed to be stable, change the independent variables, and come out with valid scientific research regardless of the results, because we are looking for implanting the process of thinking and researching in those students.

However, our resources are limited and we must admit to that. So, after an entire year of work, how much of the information that the young researchers came up with is convincing to them? That question is, “What do we aim for?” because that is how we get the “wind” of thought, when nothing is just a given truth anymore.

Our school curriculums are not as bad as a lot of people might think, but the problem lies in that we teach such curriculums on the basis of memorization rather than understanding. Here, I am not speaking of the private schools, which charge more tuition than universities do. Instead, I am speaking about the public schools. (We have 2,700 schools in Palestine, 2,200 of which are public schools that offer teachers no more than \$500–\$600 a month.)

Now, you are going to say that I got into politics, but everything in Palestine has to do with politics. Even if you are talking about love, the discussion will turn into politics in few minutes.

At Al Nayzak, we believe that scientific thinking help us reach a better way to solve fundamental life problems, and this happens through scientific research, scientific production, innovation, and capacity building from a young age.

Usually, we think of the following problem: How do we teach innovators in Arab countries, where the formal educational system is based on memorization? Here, I would like to answer through a personal story. When I was in first grade, I was in a humble public school. Once, my teacher asked about the benefits of trees, and all of those who were “good students” (according to the definition of the school and the education system—which meant that I wasn’t one of them) talked about everything: fruits, wood, shade, etc. I said, “My mom ties a rope between two trees and hangs our clothes to dry on it. Of course, they expelled me from school for a week after that answer. If I want to work with an innovator and say that the sky is the limit, I need to expect answers other than those which I have in my book, and I need to refrain from

judging new ideas by their immediate results. The teacher, after all, needs to be ready to hear ideas other than those in his or her head.

I would like to note that Al Nayzak is built on programs rather than projects. These programs are twofold: (1) improving our ability to think and (2) offering hands-on science education. In building innovative youths at Al Nayzak, we aim at excellence rather than perfection.