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# Education



PHOTOGRAPHS BY RINA CASTELNUOVO FOR THE NEW YORK TIMES

Arab students, left, who represent 20 percent of the Technion student body. Students at the biorobotics and biomechanics labs, top right; and students receiving instructions on safety procedures at the university's "clean lab."

26.63x35.41	32	8 עמוד	herald tribune	15/04/2013	36568833-2
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# The school behind Israel's tech evolution

HAIFA, ISRAEL

## Since it opened in 1923, Technion has been a generator of innovation

BY DANNA HARMAN

When the Technion class of 1957 graduated, its members got together and wrote a letter of complaint to Prime Minister David Ben-Gurion, who was otherwise busy building a nation.

"There were no jobs for us in our fields," recalled Gideon F. Inbar, an electrical engineer who is now 79. "My wife kept saying, 'Oy, things are grim, grim, grim.'"

In 2013, the student body has pretty much the opposite problem.

"Officially, the rule is that first- and second-year students should not take outside jobs," said Peretz Lavie, president of the Technion-Israel Institute of Technology, Cornell University's partner in creating an ambitious graduate school for applied science and engineering in New York City. Mr. Lavie, a psychophysicist who periodically ducks out of his roomy hilltop office to check in on his sleep-disorder laboratories and two start-up companies, acknowledged that exceptions were made. Often. Because getting out and ahead in the work force is, in many ways, the very idea.

"They turn a blind eye," noted Asaad Malshy, 24, who is studying physics and electrical engineering while working two afternoons a week at Intel, one of Israel's largest employers. "I used to dream that I would finish university and get a job in high tech," he added, "until I realized the dream was already in

reach."

One recent weekday evening during the exam period, Mr. Malshy was at the game center in the student union, where young men and women were slouching on couches behind Falcon flight simulators or facing off in FIFA 13 soccer matches on a wall of monitors — each one with a knapsack still strapped firmly onto both shoulders.

"It's a pressure cooker here, and doing O.K. requires a lot of effort," Mr. Malshy said. "This university consumes you, and you don't get a break if you have a job, or even if you start your own company." He added with a grin, "You still have to pass advanced integral algebra."

But if Technion has refused to coddle its charges — about 9,000 undergraduates and 3,800 graduate students — I.B.M., Intel, Microsoft, Yahoo and the like will make up for it. All have set up offices along a direct bus route from the student housing, recruit heavily from the student body and offer working hours that take those advanced integral algebra exams into account.

Much as Silicon Valley popped up around Stanford University, and Route 128 near Boston has come to symbolize high technology because of its proximity to the Massachusetts Institute of Technology, so Technion has transformed the sleepy northern city of Haifa into a buzzing high-technology center.

In a country known as start-up nation, Technion is not the only university where students can bury themselves in robotics, engineering and computer science labs, but it is generally considered the best. When M.I.T. is mentioned in a movie showing in Israel — "American Pie," for example — the Hebrew subtitle simply says "Technion."

Conceived by the Zionist Congress in

1905, in part as a response to the exclusion of Jews from engineering studies in Europe, Technion finally opened in 1923, when there were no Hebrew words for most of the technical terms needed to teach a basic engineering class. Since then, the university has come up with more than just translations for "aerodynamic" and "nuclear."

"I can say without exaggeration that Israel could not have been built without the Technion," said Yossi Vardi, who has founded or helped build more than 60 companies in Israel and has five degrees from Technion. "There is a Technion graduate behind practically every highway, desalinization plant, new missile technology and start-up company in the country."

### "Israel could not have been built without the Technion."

That is not mere school spirit talking. According to **Shlomo Maital, senior research fellow at the Samuel Neaman Institute for Advanced Studies in Science and Technology**, a part of Technion, a quarter of the university's 60,000 alumni who are of working age have initiated a business at one time or another, and a quarter are chief executives or vice presidents.

Among inventions from Technion research labs: the memory stick, drip irrigation, the Parkinson's drug rasagiline and the Iron Dome air defense system.

"Just how does the Technion do it?" Mr. Lavie asked rhetorically.

A key to the Haifa curriculum has been learning by doing. Interdisciplinary courses that combine business and innovation — like Technological Entrepreneurship, taught by Dan Shechtman, a Nobel laureate in chemistry — have

been the most popular on campus.

The curriculum at the Technion-Cornell Innovation Institute will be similarly multidisciplinary. The institute is a major component of the new Cornell Tech campus that is scheduled to open in 2017 on Roosevelt Island in New York. The program has been rolled out in temporary headquarters in Chelsea, a Manhattan neighborhood.

Craig Gotsman, a Technion computer science professor with two start-ups under his belt, will direct the institute, which will eventually account for a third of the academic activity on the Cornell Tech campus. Next year, the institute will begin recruiting students who are interested in "connective media," one of three focal hubs. (The others are "healthier life" and "built environment.")

The hope is to build an ecosystem like the one at Haifa, where industry and academics feed off each other.

Mr. Vardi, a Technion board member and one of Israel's most high-profile entrepreneurs, put it more simply: "What the Technion is really bringing is its genes. It's like bringing in genes from outside the family." When tasked with explaining where the innovative fervor comes from, Israelis often refer to DNA — a belief that there is something genetic in the determination of its students.

"Teaching entrepreneurship is extremely difficult," said Saul Singer, co-author of "Start-Up Nation: The Story of Israel's Economic Miracle." "But it is clear that to succeed in it, your students have to understand something about being on a mission. You have to know what it is to be part of something larger than yourself." Immigrants and soldiers, he said, understand. Military experience, mandated in Israel, instills leadership, teamwork, improvisation, obedience and sacrifice and means that students

are older and more focused. Israel is also a country of newcomers, he added, hungry for success, willing to take risks and good at adapting to new situations.

Alon Wolf, who directs the biorobotics and biomechanics lab at Technion, had another theory. "People say it's the army, or the stressful, uncertain life in Israel that makes youngsters resilient and pushes them to think out of the box and find a way ahead," said Dr. Wolf.

"But I'm telling you, it's the Jewish mother. I look at my wife" — an industrial engineer at Technion — "she is on the kids' case day and night. 'Did you do your homework? Good. Now, what was it about? Why did they give you that homework? And what about your extracurricular activities? Tell me about that.'"

Others talked of chutzpah, the same cultural trait of audacity and arrogance that propelled the class of 1957 to write to the prime minister to complain about not finding good jobs, and that continues to propel so many current graduates as they charge into industry.

Mr. Malshy does not buy into the chutzpah culture. He did not have a Jewish mother, did not serve in the army and is not an immigrant. Like 20 percent of the Technion student body, he is Arab. Asked what created the bubbling innovation on campus, he said that it was the teaching. No DNA involved. "They take students who are already talented and at the top of the class," he said, "and then hammer excellence into them, and not just excellence, but the expectation of innovative thinking. That's what happens to us."

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