

MIT and the Engineer of 2020

I believe that MIT has earned its place as the top University for Engineering in the world. From my own experience and from various sources of reports and statistics, it is clear that MIT is doing the best any university can in order to prepare its students for the future. According to the National Academy of Engineering's project "The Engineer of 2020", the engineer of 2020 needs to develop strong analytical skills, practical ingenuity, good communication skills with multiple stakeholders, business and management skills, ethical standards, become lifelong learners, and have the ability to frame problems in operational and socio-technical contexts. According to the report of the Task Force on the Undergraduate Educational Commons in 2006, MIT has been working toward those very goals and most of those qualities have been an intrinsic part of MIT culture for decades. Many of MIT's attributes contribute towards how well it is preparing its students for the future, and I feel that it is the perfect fit for me and my goals.

One of these attributes is the collaborative nature of the Institute. MIT has a long tradition of collaborative work among its graduate and undergraduate students, especially on problem sets within certain communities. On certain problem sets, one of the first requirements is to list the names of students you worked with on the assignment. Also, in UROPs (undergraduate research opportunity programs) or any research at the Institute, the tasks are divided into specific parts so that the whole research group has to work as a team to complete a goal. So, this collaborative nature is something that is necessary for any student who wants a career in science or engineering because often the work is completed through teams.

The general institute requirements (GIRs) provide MIT students with a good foundation in communication skills, the principles necessary for a degree in any area of science or

engineering, and also forms a shared cultural experience among incoming students. The GIRs also provide students with an integrated experience of professional and liberal education. There is an emphasis on "useful" knowledge, which was something the founder of MIT, William Barton Rogers, thought very highly of. One of MIT's values is employing useful knowledge in order to harness the power of technology to be used for the betterment of society. This emphasis on societal responsibility means that the MIT curriculum focuses on more in depth covering of concepts rather than brief coverings of facts. In this way, the curriculum seems suited towards one of the necessary skills of the engineer of 2020: MIT students develop thinking skills rather than amassing outdated knowledge, they are provided with the motivation for continuous learning and self-education, and learn strong analytical skills so that they can solve problems in many different contexts instead of memorizing items case by case.

The rigor of MIT's curriculum is well known, and is also an important component in how MIT prepares its students for their futures beyond the Institute. Most undergraduates do not treat the Bachelor of Science degree as the final degree, and 60% go on to higher education (i.e. graduate school). So, since MIT has such a rigorous undergraduate curriculum, most students who go on to graduate school feel they were very prepared for the more advanced work a Master's or Ph.D requires.

Many institutions of higher education are emphasizing shifts that will allow their students to become leaders in the future. These shifts include international awareness, a more rigorous core curriculum, a change in the focus of new student orientations, and an emphasis on department integration. Reports from Harvard, Yale, and Princeton show that these areas are in need of an overhaul, and MIT's Task Force report also showed similar findings. This shows that MIT and other institutions of higher learning within the United States agree on changes

that need to be made in order to meet the challenges of 2020, and that this competition in curriculum changes is a healthy one.

MIT provides international awareness for its students through study abroad programs such as MISTI and the Cambridge/MIT exchange. Also, there are globalization courses provided with the intention of giving undergraduate students more information about where they stand in a global context . Since many believe that the world is becoming "flat" in the sense that international relationships are becoming more attainable, it is becoming increasingly important to give students a global perspective.

However, according to the RAND report, the United States may be in danger of becoming less of a leader in science and technology because other countries are producing skilled engineers at a higher rate. Engineers will be even more important in the future as the world faces pressing problems such as an aging population, energy and environmental needs, medical issues within biological engineering, and population growth. Fortunately, MIT is producing many more engineers than its competitors and so in this way it will probably become even more successful in the future. So, I believe that MIT is doing the right things to prepare me for the future, because it has such a strong sense of societal responsibility and is changing to meet the needs of the future. One example is the fact that MIT has instated a new minor called the Energy minor, meant to increase awareness about alternative forms of energy (which is a pressing matter now, and will only continue to become a more critical issue).

Though MIT has been preparing its students very well so far in terms of meeting the needs of the future, there is still some room for improvement. For example, the GIRs perhaps should include a computer requirement. It would not have to be a programming course, but at least something to provide students with an introduction to a tool that will be so crucial to their

success as a scientist, engineer, architect, etc. This, or an engineering requirement, would give students an opportunity to explore options they may not have had in high school. Most students (if not all) come to MIT with backgrounds in math, physics, biology, chemistry, etc. However, not quite as many students are privileged enough to have been exposed to a rigorous computer or engineering course. I was able to take both types of courses while in high school and I feel I have benefited from the exposure immensely, but anyone who was not able to take courses in those areas could feel uninterested in trying them for the first time at MIT without the support of a freshman group. Another area that MIT could improve on would be the area of advising. Within the Task Force report, it was mentioned that advising should seek to integrate the aspects of community, academics, and research at MIT. This would provide students with a more unified experience and they would feel more confident in their abilities to move between separate areas. Also, MIT could put even more emphasis on global context, beyond MISTI and other abroad programs. There could be a requirement to fulfill a "significant international experience" (something Harvard requires), or more classes could be offered that allow students to learn how to solve problems in an international environment (with an emphasis on how to handle cultural differences and a deeper understanding of foreign economies).

Before coming to MIT, I had been used to a small high school that was pretty relaxed (it was an art school). MIT provided me with the opportunity to make the transition to college life through one of its freshman programs, ESG (Experimental Study Group). ESG has provided me with an amazing community of freshmen and upperclassmen, as well as an extraordinary array of faculty. So far, MIT has provided me with what I need out of an institution, a community that supports me and students who I can work with collaboratively. I also want to

develop very strong analytic and creative skills from my education at MIT, and according to the Task Force report most alumni said that "creativity and the ability to deal with new challenges", were two of the greatest contributions that MIT made to their adult lives. I also really want to have a strong community after I leave MIT, and from what I have seen of MIT alumni they are all very well connected. I also plan on going to graduate school (perhaps getting a Ph.D, depending on whether or not I go into Engineering or Science), and according to recent data 74% of MIT students that apply to graduate schools get in to the top ten graduate schools. Also, I want to have an education that will prepare me for work abroad. MIT would prepare me for this through programs like MISTI and IROPs. MIT's reputation and rigorous curriculum will enable me to live a life of intense curiosity, fulfilling research, and creation. Since I am immersed in a diverse student body, I will also be more prepared for the changing demographics that will affect the work force (in 2000 the engineering work force was 93% asian/white, in 2020 it is estimated to be only 69.4% asian/white), and I welcome this change.

Essentially, MIT and many other institutions are constantly adapting in order to meet the challenges of the future. I feel that MIT will instill in me that same ability to adjust to swiftly changing technologies so that I can meet the challenges of 2020 and beyond.

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