Fostering Personalized People at Massachusetts Institute of Technology

Yu-yao CHENG¹ and Ze-jun ZHANG²,*

¹School of Education, Heilongjiang University, Harbin, China
²College of Computer and Information Science, Fujian Agriculture and Forestry University, Fuzhou, China

*Corresponding author

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Abstract. Massachusetts Institute of Technology enjoys a high prestige in the world. She is known for the rigorous academic of science and engineering. MIT pays great attention to the cultivation of students, in addition to the traditional lab environments, the involvement of cultivating students' creativity and imagination, tolerance and support students’ idea. Based on this training mode, students become personalized people, far from “herd”. This is the best reason that MIT come out in front of the world university.

Introduction

Massachusetts Institute of Technology is often referred to as MIT, founded in 1861 in Massachusetts, Cambridge, is a private research university and cited as one of the world’s most prestigious universities. The two most famous majors are Computer Science and Engineering. For several years, MIT is often ranked among the world’s top universities overall. It ranked first in the QS world university rankings[1], ranked fifth in the academic ranking of world universities (ARWU)[2], ranked second in the U.S.News of the world’s best universities[3], and ranked fifth in the 2016-2017 world university rankings[4]. In its 100 years of history, 85 Nobel laureates, 6 Fields Medalists, 19 Turing Award winners have been affiliated with MIT. The number of Nobel Prize winners is the top eighth in the world.

In this science shrine, a number of well-known Chinese people graduated from here, such as Zhang Chaoyang, who is the founder of Sohu, and chairman of the board and CEO of Sohu; Qian Xueshen, who was the father of atomic bomb, hydrogen bomb and artificial satellite in China; Zhang Zhongmou, chairman of Taiwan integrated circuit manufacturing company.

In this paper, we are beginning to look at how it comes to educate and train student’s creativity or creative thinking skills.

Mind and Hand

When Massachusetts Institute of Technology was established formally, the president William Barton Rogers wished that education should meet the needs of social industrialization development continuously. The school should be a combination with elements of both professional and liberal education[5]. He proposed that “The true and only practicable object of a polytechnic school is, as I conceive, the teaching, not of the minute details and manipulations of the arts, which can be done only in the workshop, but the inculcation of those scientific principles which from the basis and explanation of them, and along with this, a full and methodical review of all their leading processes and operations in connection with physical laws.”[6] So physical laboratory, chemical laboratory and mining processing laboratory was set up firstly.

Rogers thought highly of Edward C Pickering who founded physics lab: in respect of imparting scientific knowledge, he carried out a very important reform firstly; it was the number one in the world. [7] And he hoped that students should learn from nature by using their own brains and hands, strengthened their conviction “learning by doing”, did “Mind and Hand”. 

24
The school's motto is “Mind and Hand”. It means “both thinking and hands-on”. So Massachusetts Institute of Technology can be defined as a university polarized science, engineering, and the arts. In the process of teaching, Massachusetts Institute of Technology pays more attention to the cultivation of rigorous theoretical knowledge and practical ability. From the point of teaching theory knowledge, logical deduction is focused on and students' understanding is paid attention to each course. Students often burn the midnight oil to do their homework. It is absolutely impossible to do things carelessly and bluff it out. The fine tradition is carried on from generation to generation. Academic level and learning culture are more rigorous and strong. From the point of training practical ability, most courses will be finished through a group of cooperation or independent projects. It will be asked that students complete the project by themselves not only using theory knowledge but also practical knowledge. MR Rush investigates student acquisition of creative thinking skills in engineering design courses at the Massachusetts Institute of Technology through a case study methodology. He finds that students from teams they believe to be more creative feel as though they themselves have had a greater increase in their creativity over the course of the semester. MIT attaches great importance to practice. There are some famous enterprises always cooperating with MIT. Students have more opportunities to take part in the projects. This will effectively improve student’s enthusiasm. Thus students often shuttle back and forth with all kinds of strange modes between laboratories.

Academic and Academic Atmosphere

The campus of MIT has a strong and particular flavour of saturated years. The campus likes a science & technology museum and history museum. Academic achievements are exhibited all over the school. Showcases are filled with old experimental instruments and research notes. The students are attracted by such special learning and research environment. In this prestigious school, there often have meetings or activities organized by social groups or companies. Students can easily participate in, and communicate with social people. Usually, on the road, you can see entrepreneurial seminars organized by students. You can also see the recruitment from social groups and companies. The school establishes a closer relationship with society. This makes the campus lively.

“Getting an Education from MIT is like taking a drink from a Fire Hose.”

Because of learning at high pressure, students smile and say it is ”pressure cooker learning”. In order to reduce students’ pressure, after examination during first semester, students only get information about failing or passing the examination, there are no rank, no mark. There are three tasks in the school. They are Study, Sleep, Social Activities. In general, MIT’s students can do two of them. Someone who can finish all, always be called a "Superman". In MIT, students must take 360 credits to graduate. In the heavy learning, students survive in the cracks. You can see students running and reading at the same time on the treadmill. In the 24 hour room, someone maybe reading, checking and taking a nap. Time is the least of students’ concerns when they begin to learn. And they do not care about where he is when they want to sleep. It is so rare that students study hard. But even so, there are only 92% students can graduate (the United States ranked in the top third).

Personalized MIT

Trick is the essence of MIT’s culture. Freshmen will be asked to climb the pipeline and school's landmark building by senior schoolmates when terms begin. MIT's school museum once opened a special hall; it was named as “Hall of Hacks”. In the school's official website, a two level domain website is set up. It is designed to record all kinks of tracks over the years. These tracks are classified by time, location, type, etc. And even there is a ranking list of the best practical joke on the website.

In MIT's school rules, a word is "creative pranks can be understood and tolerated").
MIT’s Training Mode

The training mode determines the students’ emotion, knowledge, ability and quality largely. These factors are a basic guarantee of education goal. In MIT, teaching task focus on cultivating students’ independent thinking, analyzing, criticizing and solving problems abilities. The training mode mainly includes three elements: reform of teaching system, special teaching mode and a fertile learning environment.

Reform of Teaching System

The fundamental reason for unfailing on talent development in MIT is that the principal insists on the reform of teaching system. Teaching system is the beneficial guarantee for students' all-round development and individual development. It is also the guarantee of improving teaching quality and ensuring talent quality. Universities in the United States give commendation to those outstanding graduate research results at commencement each year.\[12\]

Unique Teaching Mode

MIT’s teaching mode includes static theory and dynamic practice. Yu\[13\] give seven course of MIT. Four are lecture-based course, two are lab-based course, and one is theory course. Lecture-based course has experimental hours. Experimental hours is at least one half of teaching hours every week. For lab-based course, experiment hours are twice of teaching hours every week. MIT attaches importance not only to liberal education, but also to the role of cooperation and practice. In addition, entrepreneurship courses, doing everything by themselves, and self-employment is given more attention.

Create a Good Environment

Education quality depends on educational environment of the University to some extent. MIT pays high attention to the role of the cultural environment.

In the United States, universities compete with each others, especially between the elite schools the competition is more intense. Because of competition, students have more vitality and energy to get new idea for all sorts of strange match. The students of these schools are all geniuses. They give the rein to their plenty of imagination and creativity, and play against each other classically and excellently. MIT can’t restrict students’ imagination; on the contrary encourage students to carry out a variety of research publicly to train students’ imagination and creativity. As long as they have a good idea or a good plan, the school will support them to finish their creative design. The school takes every opportunity to encourage and foster innovation. Brainstorming, or the process of producing several ideas in a short period of time without regard to their use or novelty, is probably the most frequently encountered in the classroom\[14\].

MIT students put a plane model on the roof of the main building to show respect for White. There is a projection on the first floor of building 16 in MIT, which is used to play the circulation system made of waste materials by students during the day. As if they are boring and insignificance things, but actually they subtly influence student innovative thinking and creative awareness.\[15\]

Enlightenment to Chinese Education

Creating New Teaching Methods and Ideas, Motivating Creative Thinking

Albert Einstein once said: "if the average is asked to find a needle in the haystack, the person will stop when he or she find a needle. I, on the other hand, will tear through the entire haystack looking for all the possible needles." Innovation quality is based on cultivating students’ innovation consciousness. In order to achieve, teachers themselves should have the sense of innovation. Then they can lead the students to be good at study, exploration and practice. Students’ enthusiasm, new thinking, new ideas will be aroused. At the meantime, their ability to challenge problems will be improved.\[16\]
Promoting Students' Autonomous Learning, Encouraging Group Cooperation

The mode of education in colleges and universities in our country is bound by the traditional teaching mode. Teachers pay more attention to teach in the class. Students only have limited time to think independently and cooperate with others. Teaching mode should be reformed in our country. Teachers should guide and interact with students, and not unilaterally take into account teaching. Students should study in relaxed and harmonious classes. They have more time and space to think independently. Everyone is willing to take part in the project group and cooperate with others in the team.

Cultivating Students' Creative Ability and Personality

It is necessary to teach students extensive scientific knowledge. Only have enough knowledge they can give full play to their ability. Furthermore, increasing international education can strengthen exchanges among domestic and abroad. Students have more chances to expand their worldview and ideals. Through exchange, innovation ability can be improved once again. Finally, building a democratic, free, positive learning environment and atmosphere, encourage and guide students to practice, cooperation, communication, and innovation.

Conclusion

Creativity is believed to be an underlying driver of innovation. Creativity (invention, innovation, thinking outside the box, art) is an indispensable quality for engineering. Through above analysis, we should cultivate students to have plenty of imagination and creativity, to have the courage to bring forth new ideas, to go against old thinking habit, dare to challenge teacher, dare to challenge authority. In order to cultivate students to become versatile talents, we should combining literature with science, combining theory with practice. Let students begin their learning in a more informal atmosphere of play, and learning while playing.

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References


