As an incredible scientist, Richard Feynman's critical part in the physics of the 1900s is undebatable although it is not always well-recognized. However, his studies are noteworthy even today.

Feynman, born in 1918, has been a prominent figure in various areas of physics, like quantum mechanisms as well as in the whole area. Feynman also played a role in a project from the past century that is well-known for its innovative outlooks as well as the demolition it caused Now, let's learn more about the story of this prodigy and his studies.

In this summary, you will learn

- how Feynman was raised to be a scientist since his childhood;
- how did Feynman achieve his Nobel achievement; and
- why the lessons he gave are still relevant even after his demise.

Chapter 1 - Feynman was encouraged to think intellectually from a young age.

Prior to Feynman's birth, his father had a guess: if his baby was male, he would work in science in his future. This conjecture indeed became reality, but it was more related to the way Richard grew up.

Melville, Feynman's father, had immigrated to the USA from Europe. He wanted to pursue a career in the field of science, but because of his socioeconomic background, he was unable to choose this path. So, he gave up on these aspirations, and made a career in sales and marketing, projecting his dreams on his kid.

Consequently, Richard's mind was programmed to think in a science-oriented way from a young age.

Even when Richard could not speak, he was learning about how to identify colorful motifs in different shapes from his father.

Merville also often brought Richard to museums and told him the information on the exhibited objects by making him conceptualize their various attributes. For instance, when he was talking about T-Rex, he suggested how this dinosaur was tall enough to lend up at his room, although his head was too big to fit from the window.

His father also ensured to tell Richard about the functions of things and the factors that helped them work in the ways that they do.

When they were hiking on a hill, Merville asked him to name every bird they came across. Whenever Richard was unable to tell the names, his father would recount them in various other languages.

Even though this might sound pretentious, Merville had an aim with this practice which was to show Richard how the naming of things does not necessarily describe them. In other

words, knowing what a bird is called does not necessarily mean you know anything about it. Actual information lies with examining and comprehension.

Feynman talked about this idea at a meeting concerning the course material of a school. The style of these textbooks consisted of indistinctive passages that lacked further explanations. Further suggested for these materials to be written in a more thorough and informative way. He was irritated by the unintellectual way the students were getting their educations that did not push them to actually understand how objects function.

Chapter 2 - The strategies Feynman used in maths contests to succeed were identical to the ones he used in physics questions.

When it came to his academic abilities, Fenman was a marvel at this area; however, the same could not be said about his social and athletic skills.

He was much more at ease when he was competing in the Algebra League.

In the school-oriented ways of doing Maths, the focus is usually on the various styles a problem can be solved, in contrast, algebra competitions are usually more interested in is the actual result of the problem.

As in these contests, the aim is to arrive at a conclusion as quickly as possible, winning usually depends on how well one departs from conventional formulas. So, you need to get creative. Feynman, who was raised to think outside the box, managed to do this. These contests were the most suitable area he could show his skills.

Feynman was able to reach the solution immediately meanwhile others were still thinking hard and trying to work it out.

While the problem was still being told to the competitors, Feynman was able to solve it correctly.

An example of a question from these events can be how long would it take for a cap that fell into the river from a ship to be brought back. Although other mathematical measurements were given, Feynman instantly realized that it would take the same time it has been lost for because of constant speed without being distracted by the useless details.

His special way of solving problems in visuals aided Feynman greatly during his professional life.

His colleagues often suggested that Feynman had the habit of imagining himself in the position of whatever the actors were on the problem he was trying to solve, visualizing what it would be like an atomic figure.

Chapter 3 - At university, Feynman was utterly consumed by the field of physics.

As a freshman at MIT, Feynman was questioning what the aim was if he studies mathematics. The chairman suggested that this questioning itself showed that this field was not the right fit for him as a student.

Feynman was an excellent mathematician who even started giving lessons on this field at a young age. But at MIT, he started losing interest in this field as it was not as concrete of a subject as he wished it would be. So, he started focusing more on physics as a university student.

In these years, his enjoyment of the issues physics presented to him grew as well as his skills in accumulating rubrics to reach a certain result. He even urged other members of the faculty to share the scientific inquiries they had at their hands.

Though, his utter commitment to this field was starting to influence other areas he was supposed to study.

Especially classes that involve humanities, like history, were not subjects Feynman was good at. His hatred of music classes even caused him to experience distress in his body. When it came to philosophy, he had no respect for the teachings of it as its thinkers were unskilled intellects in his opinion.

This response was a result of how he was raised. He regarded studying these subjects as mere memorization, rather than actual learning.

So, he ended up passing these subjects by cheating. Moreover, his low grades were too close to cause his rejection when he appealed for a position at Princeton.

Chapter 4 - Feynman was a member of the Manhattan Project and was part of the team that created the atomic bomb during World War II.

In the 1940s, the possibility to divide an atom, and as a result building a bomb with this function, was a topic of discussion. According to the most renowned scientists of the planet, the probability of this was inarguable as they believed an invention like this was just about to be built.

A number of these experts were trying to build a never-seen-before bomb like this in a secret base in New Mexico, USA.

As a senior in graduate school, Feynman was recruited to work in the Manhattan Project, in which the aim of the physicists was to find out how much uranium was needed to create a nuclear weapon.

Because of the credits he has earned as a young scientist, Feynman was asked to participate in the project. After a short while, he was assigned to lead a group of members, which was not common for his age.

Feynman earned the trust of his colleagues by finding unique ways of solving the issues they were studying. However, along the way, there was some negative feedback too, like how some regarded his ways too unconventional. In the end, Feynman always seemed to be correct with the ideas that he pitched. Following a few victories, the members Feynman was leading showed complete belief in him.

Although theoretically, it was not difficult to create a nuclear weapon, the same could not be said for bringing the necessary elements together in the actual world.

Feynman was now dealing with turning what he envisioned into reality which meant that the consequences of what once was only in his mind, could turn into a catastrophe even with a tiny mistake.

Therefore, to prohibit such a disaster from happening the team showed the utmost attention to little details like melting degrees to ensure the reaction would go smoothly.

And as it is widely known, all these experiments would become successful. In the summer of 1945, the first atomic bomb was exploded offshore of New Mexico.

Chapter 5 - Feynman won a Nobel award with his ability to turn the abstract into concrete.

It has been suggested that it takes up to eight hundred days to truly learn how to play an instrument. After that, playing the instrument comes instinctively to the player as it becomes an action that is done automatically. There is no actual labor in the action.

Feynman's mind functioned in this way too. The time he take up making abstract problems into concrete ones as well as his natural instincts in the sciences and mathematics taught him a lot of things.

Feynman became a master of Maths in such a masterful way that he was easily capable of applying what he learned in this field to natural sciences. This made it possible for him to work in an interdisciplinary way, using varied objects across varied dimensions.

A question that was directed at Feynman was whether or not colors played a role in his studies. Feynman's answer was that certain wavelengths in the spectrum were indeed influential in his process. (He also claimed that he was not aware whether his pupils also had undergone this or not.)

When Feynman established "Feynman diagrams", he was able to de-complexify the studies of quantum mechanisms for everyone who studied it.

In this year, 1947, Feynman also introduced his findings in electromagnetism as well.

His diagrams proved to be highly useful terms of explaining complicated figures in a simple way in an instant. Particularly with quantum physics, the necessity to make use of highly difficult formulas was no longer required because of Feynman's diagrams.

Still, it was difficult for Feynman to explain these diagrams when he won a Nobel Prize for them.

On the night that the winners were named, a bunch of journalists was already at his house before the morning, trying to make sense of what his achievement in physics was. Though he tried really hard to describe them, it still was not really understood.

As one of the journalists requested for him to explain it in 60 seconds, his reply was that if he was able to answer this question, then his achievement would not really be qualified for such a prestigious award.

Chapter 6 - Feynman's lectures soon turned to be distinguished ones for the scholars.

Although Feynman's excellent abilities as a lecturer were very well-known, it was hard to catch a class of his because of the limited number of them that he chose to give. However, the ones who had the privilege to join one of these lectures knew how extraordinary they were.

At the last place he had a teaching position, Feynman gave a beginner level class on physics which took two years. This was something that was unheard of.

Feynman invited the attendees of his class to the wondrous field of physics, making them see the whole subject from a completely original point of view which belonged to him.

As it is expected, his lessons were not memorization-based, but rather made sure that the terms were thoroughly learned by visualizations of them.

As the class dug deeper into this field, 1st and 2nd-year students were no longer able to understand some concepts, so they gave up the course. However, Feynman was not really worried because the empty chairs would be happily filled by older scholars.

Because his lectures were captivating, and because there were no texts of Feynman's unique set of knowledge, recording what he told in classes with notes became a necessity. Later, these texts were turned into a book series which came to be known as "the red books".

These transcriptions of his lectures were attempted to be added to their curriculum by many colleges, however, they proved to be too difficult for many students. Still, for many educators, these texts were significant in making them gain new perspectives on physics.

This comes from Feynman's firm stand on giving his students practical ways of scientific investigation.

Feynman's achievements in fields like quantum mechanisms also is a result of using these kinds of unconventional teaching methods.

The methods he showed in deciphering complex physic problems in quantum studies are still relevant today. In addition to this, he left other problem-solving tactics to examine information that is still in use.

Chapter 7 - Feynman was known as a wild-card however his true reputation lies within his uniqueness.

Feynman is still recognized today because of several factors. Oddly, one of them is how he played the bongo.

Bongos usually don't come to mind when you think of an intellectual. When Feynman was on holiday in Brazil, he started playing this instrument. Although he was not fond of the music of his age, he liked percussion, and the freedom this type of instrument provided him in his artistic expression. Later, he improved his bongo skills as well as being a local-based musician.

Feynman was also known as kind of a jester. He enjoyed telling tales that were hard to believe, whose publications were also surprisingly highly well-received.

Feynman of course did not write these stories in a completely honest way, as you are supposed to for good storytelling purposes. However, his fellow scientists were worried that these books would minimize the humorless quality of natural sciences. On the other hand, it cannot be denied that these stories show an important part of Feynman as a person.

Feynman was also someone who was ready to disregard others' contributions to be an unconventional scientist. He was really concerned that his thought process would be affected by others' views which would prevent him from thinking in reformist ways according to Feynman.

So, he tried to avoid reading academic articles, particularly the beginning parts of them that included the conclusions. He was only interested in the issue the paper was introducing to look at it from his own perspective.

Not everyone approved of this attitude. His focusing on only certain parts of a study was regarded as thoughtlessness. For the most part, some of Feynman's great theories were not issued anywhere because he did not find them as original as others.

For some this behavior from an extraordinary physics prodigy was disappointing.

However, choosing what is unconventional was what Feynman made a habit of, and showed his pupils. A determinist way like this might not ensure you will become successful, but real revolution comes from such uniqueness.

Genius: The Life and Science of Richard Feynman by James Gleick Book Review

Richard Feynman was an extraordinarily bright scientist for many of his peers. However, his name is still not known by many people n spite of his great achievements. He was not a scientist who brought one big innovation in physics, but rather someone who brought various distinctive outlooks that offered pragmatic alternatives to scientific problems. His achievements have offered helpful alternatives to physicists and continue doing so.

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