# Lesson 2, Reading 1
# The Feynman Technique

MSc. Tran Quang Khai

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## 1 Before reading

There are many different purposes for reading depending on the *environment* we are living and working in. For example:

- Reading for *relaxing* at *home*

- Reading for *working* at the *office*

- Reading for *researching* at *university*

- Reading for *studying, examination* at *school*

Basically, we can see that most of the time we are reading under two circumstances: *reading under pressure* and *freely reading*. Reading for working, reading for researching, and reading for examination are some examples of reading under pressure. The pressure here is usually time. It means that we are strictly tied to some time constraints: we have to read several daily reports to make a weekly report; we read a lot of books and academic papers to write our own paper and hope that it will be published within a certain time; we try to memorize as much information as possible when reading lecture notes for the examinations. Freely reading, in contrast, does not bound to any time constraints. We can choose the reading pace for a novel and decide when we will finish it freely.

To read under pressure, we need strategies. A common strategy is shown as following:

☛ Determine the requirements of reading: does it require us to make a report, to find some specific pieces of information, or to answer some questions?

☛ If it requires us to answer some questions, read the questions carefully for at least two times and make sure that we understand the questions.

☛ Does it require us to answer those questions with in a period of time? If yes, we should choose a reading technique (from the last class) that helps us read and capture the ideas as fast as possible. (Which technique(s) does satisfy this requirement?)

☛ After decide the appropriate reading techniques, we can also decide the reading direction. There are two common directions for reading:

⤵ Top-down: read the text first for all information, then read the questions, and then answer them. This direction is recommended for skilled readers, or for the tests that are not so strict on the time, i.e., you have several hours or some days to read.

⤴ Bottom-up: read the questions first, then read the text for related information, and then answer the questions. This direction is recommended for beginner to intermediate level readers, or for the tests that is strict on the time.

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Tùy thuộc vào môi trường đang sống và làm việc, chúng ta đọc vì nhiều mục đích khác nhau. Có thể chúng ta đọc để giải trí tại nhà, hoặc đọc vì công việc tại văn phòng, hoặc đọc để nghiên cứu tại trường đại học, hoặc phổ biến nhất trong 17 năm, là đọc để học và thi tại trường học.

Về cơ bản, chúng ta thường đọc ở hai trạng thái: đọc dưới áp lực và đọc một cách tự do thoải mái. Các trường hợp đọc dưới áp lực thường thấy đó là đọc vì công việc, đọc để nghiên cứu và đọc để học, để thi. Áp lực khi đọc ở đây thường là thời gian, nghĩa là chúng ta thường bị ràng buộc về mặt thời gian khi đọc: chúng ta phải đọc nhiều báo cáo hàng ngày của nhân viên để làm một báo cáo tổng kết vào cuối tuần; chúng ta phải đọc nhiều sách và bài báo khoa học để có thể viết ra bài báo của riêng mình và hy vọng bài báo đó sẽ được đăng trước một thời hạn nào đó; chúng ta phải đọc và nhớ thông tin được yêu cầu từ các bài giảng để chuẩn bị cho các kỳ thi. Ngược lại, đọc tự do thường không bị ràng buộc về mặt thời gian. Chúng ta có thể chọn tốc độ đọc hoặc quyết định khi nào chúng ta sẽ đọc xong một cách tùy ý.

Có một sự thật là trong rất nhiều trường hợp, chúng ta phải đọc dưới áp lực. Vì vậy, chúng ta cần các chiến lược để đọc dưới áp lực một cách hiệu quả. Một chiến lược đọc phổ biến là:

☛ Xác định yêu cầu của việc đọc: đọc để viết báo cáo, đọc để tìm thông tin, hay đọc để trả lời câu hỏi.

☛ Nếu bài đọc yêu cầu trả lời câu hỏi, đọc thật kỹ câu hỏi ít nhất hai lần và chắc chắn rằng chúng ta đã hiểu câu hỏi.

☛ Chúng ta có phải đọc và trả lời câu hỏi trong một khoảng thời gian xác định không? Nếu có, hãy chọn một kỹ thuật đọc phù hợp (đã thảo luận ở buổi học trước) để giúp chúng ta đọc và nắm bắt ý chính càng nhanh càng tốt.

☛ Sau khi chọn được phương pháp đọc, chúng ta có thể quyết định hướng đọc. Thông thường có hai hướng đọc:

⤵ Đọc từ trên xuống: đọc toàn bộ bài đọc, sau đó đọc câu hỏi, rồi trả lời câu hỏi. Hướng đọc này thường dành cho các người có kỹ năng đọc tốt, hoặc bài đọc cần hiểu sâu, hoặc giới hạn thời gian đọc không quá chặt.

⤴ Đọc từ dưới lên: đọc câu hỏi, đọc một số phần của bài đọc để tìm thông tin liên quan, rồi trả lời câu hỏi. Hướng đọc này thường dành cho người có trình độ từ mới bắt đầu cho đến trung cấp, hoặc các bài đọc bị giới hạn chặt về thời gian.

# 2 Reading

Reading guides and requirements:

- The below article contains approximately 1500 words spanning in four pages. Students should carefully choose an appropriate reading technique from the five ones that are discussed last week to cope with it.

- Students should spend at most 30 minutes to read and capture the main idea of the article.

- Students have to answer the related questions in section 3.

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Hướng dẫn đọc và yêu cầu đọc:

- Đây là một bài đọc dài hơn bốn trang gồm xấp xỉ 1500 từ. Sinh viên cần chọn kỹ thuật đọc phù hợp từ năm kỹ thuật đã thảo luận ở tuần trước.

- Sinh viên nên dành tối đa 30 phút để đọc và nắm bắt ý chính của bài đọc.

- Sinh viên phải trả lời các câu hỏi liên quan đến bài đọc ở phần 3.

## The Feynman Learning Technique

*If you're after a way to supercharge your learning and become smarter, the Feynman Technique might just be the best way to learn absolutely anything. Devised by a Nobel Prize-winning physicist, it leverages the power of teaching for better learning.*

**The Feynman Learning Technique** is a simple way of approaching anything new you want to learn. Why use it? Because learning doesn't happen from skimming through a book or remembering enough to pass a test. Information is learned when you can explain it and use it in a wide variety of situations. The Feynman Technique gets more mileage from the ideas you encounter instead of rendering anything new into isolated, useless factoids.

When you really learn something, you give yourself a tool to use for the rest of your life. The more you know, the fewer surprises you will encounter, because most new things will connect to something you already understand.

Ultimately, the point of learning is to understand the world. But most of us don't bother to deliberately learn anything. We memorize what we need to as we move through school, then forget most of it. As we continue through life, we don't extrapolate from our experiences to broaden the applicability of our knowledge. Consequently, life kicks us in the ass time and again.

To avoid the pain of being bewildered by the unexpected, the Feynman Technique helps you turn information into knowledge that you can access as easily as a shirt in your closet.

Let's go.

> *"Any intelligent fool can make things bigger, more complex, and more violent. It takes a touch of genius—and a lot of courage—to move in the opposite direction."*
> *— E.F. Schumacher*

There are four steps to the Feynman Learning Technique, based on the method Richard Feynman originally used. We have adapted it slightly after reflecting on our

own experiences using this process to learn. The steps are as follows:

1. Pretend to teach a concept you want to learn about to a student in the sixth grade.

2. Identify gaps in your explanation. Go back to the source material to better understand it.

3. Organize and simplify.

4. Transmit (optional).

## Step 1: Pretend to teach it to a child or a rubber duck

Take out a blank sheet of paper. At the top, write the subject you want to learn. Now write out everything you know about the subject as if you were teaching it to a child or a rubber duck sitting on your desk. You are not teaching to your smart adult friend, but rather a child who has just enough vocabulary and attention span to understand basic concepts and relationships.

Or, for a different angle on the Feynman Technique, you could place a rubber duck on your desk and try explaining the concept to it. Software engineers sometimes tackle debugging by explaining their code, line by line, to a rubber duck. The idea is that explaining something to a silly-looking inanimate object will force you to be as simple as possible.

It turns out that one of the ways we mask our lack of understanding is by using complicated vocabulary and jargon. The truth is, if you can't define the words and terms you are using, you don't really know what you're talking about. If you look at a painting and describe it as "abstract" because that's what you heard in art class, you aren't displaying any comprehension of the painting. You're just mimicking what you've heard. And you haven't learned anything. You need to make sure your explanation isn't above, say, a sixth-grade reading level by using easily accessible words and phrases.

When you write out an idea from start to finish in simple language that a child can understand, you force yourself to understand the concept at a deeper level and simplify relationships and connections between ideas. You can better explain the why behind your description of the what.

Looking at that same painting again, you will be able to say that the painting doesn't display buildings like the ones we look at every day. Instead it uses certain shapes and colors to depict a city landscape. You will be able to point out what these are. You will be able to engage in speculation about why the artist chose those shapes and those colors. You will be able to explain why artists sometimes do this, and you will be able to communicate what you think of the piece considering all of this. Chances are, after capturing a full explanation of the painting in the simplest possible terms that would be easily understood by a sixth-grader, you will have learned a lot about that painting and abstract art in general.

Some of capturing what you would teach will be easy. These are the places where you have a clear understanding of the subject. But you will find many places where things are much foggier.

### Step 2: Identify gaps in your explanation

Areas where you struggle in Step 1 are the points where you have some gaps in your understanding. Identifying gaps in your knowledge—where you forget something important, aren't able to explain it, or simply have trouble thinking of how variables interact—is a critical part of the learning process. Filling those gaps is when you really make the learning stick.

Now that you know where you have gaps in your understanding, go back to the source material. Augment it with other sources. Look up definitions. Keep going until you can explain everything you need to in basic terms.

Only when you can explain your understanding without jargon and in simple terms can you demonstrate your understanding. Think about it this way. If you require complicated terminology to explain what you know, you have no flexibility. When someone asks you a question, you can only repeat what you've already said.

Simple terms can be rearranged and easily combined with other words to communicate your point. When you can say something in multiple ways using different words, you understand it really well. Being able to explain something in a simple, accessible way shows you've done the work required to learn. Skipping it leads to the illusion of knowledge—an illusion that can be quickly shattered when challenged.

Identifying the boundaries of your understanding is also a way of defining your circle of competence. When you know what you know (and are honest about what you don't know), you limit the mistakes you're liable to make and increase your chance of success when applying knowledge.

### Step 3. Organize and simplify

Now you have a set of hand-crafted notes containing a simple explanation. Organize them into a narrative that you can tell from beginning to end. Read it out loud. If the explanation sounds confusing at any point, go back to Step 2. Keep iterating until you have a story that you can tell to anyone who will listen.

If you follow this approach over and over, you will end up with a binder full of pages on different subjects. If you take some time twice a year to go through this binder, you will find just how much you retain.

### Step 4: Transmit (optional)

This part is optional, but it's the logical result of everything you've just done. If you really want to be sure of your understanding, run it past someone (ideally someone who knows little of the subject). The ultimate test of your knowledge is your capacity to convey it to another. You can read out directly what you've written. You can present the material like a lecture. You can ask your friends for a few minutes of their time while you're buying them dinner. You can volunteer as a guest speaker in your child's classroom or your parents' retirement residence. All that really matters is that you attempt to transmit the material to at least one person who isn't that familiar with it.

The questions you get and the feedback you receive are invaluable for further devel-

oping your understanding. Hearing what your audience is curious about will likely pique your own curiosity and set you on a path for further learning. After all, it's only when you begin to learn a few things really well do you appreciate how much there is to know.

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The Feynman Technique is not only a wonderful recipe for learning but also a window into a different way of thinking that allows you to tear ideas apart and reconstruct them from the ground up. When you're having a conversation with someone and they start using words or relationships that you don't understand, ask them to explain it to you like you're twelve.

Not only will you supercharge your own learning, but you'll also supercharge theirs.

Feynman's approach intuitively believes that intelligence is a process of growth, which dovetails nicely with the work of Carol Dweck, who describes the difference between a fixed and growth mindset.

> *"If you can't reduce a difficult engineering problem to just one $8\frac{1}{2} \times 11$-inch sheet of paper, you will probably never understand it."* — *Ralph Peck*

This article is extracted from the FS Blog, post "The Feynman Learning Technique". It is available online (accessed Tuesday 14th September, 2021) at:

🔗 https://fs.blog/2021/02/feynman-learning-technique/

# 3    Questions

Write down the answers for the following questions. Students can use both English and Vietnamese for the answers.

1. From *this* article only, what do you know about Feynman, the inventor of the method?

2. How many *main* steps does the technique involve?

3. Look at Step 1, in line 2 of paragraph 3 of this step, what does the word "*jargon*" mean? Show some words in your major that are considered as jargon.

4. In Step 2, what is the "*gap*" in the explanation?

5. What will you do in Step 3?

6. *"Step 4 is optional, but it is quite important"*. Do you agree with this claim? From your point of view, please show your opinion and explain why you agree or do not agree.