

Myths and Facts about Engineering

What I Wish I Knew
When I Was in University

Kamran Khodaparasti

July 2024



In these 25 years that have passed since the beginning of my career, I have the pleasure of interacting both with a number of young engineers just beginning their careers and with a lot of students at who are working towards their engineering degree.

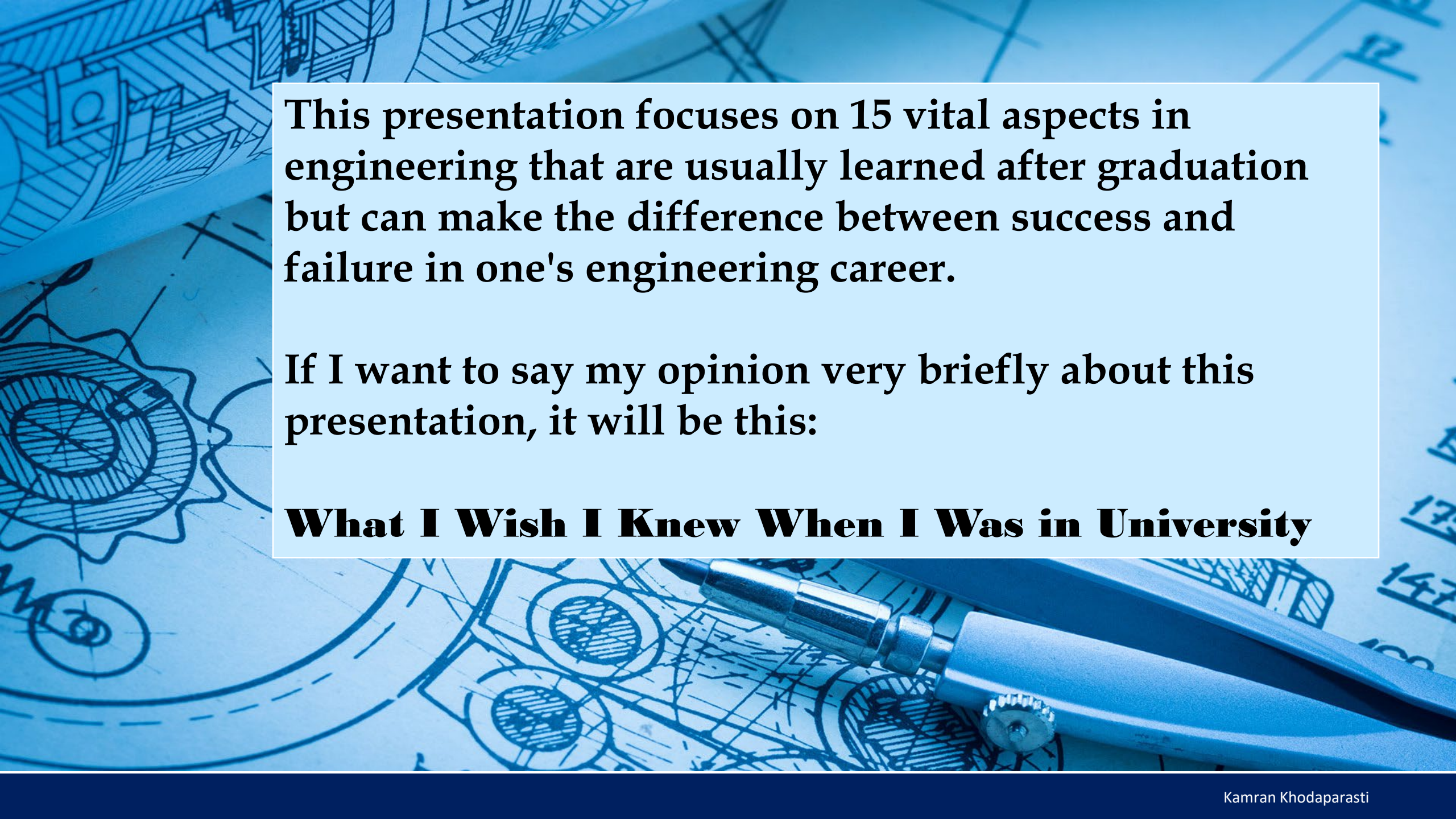
Quite naturally, this interaction often spawns discussion about careers and the question invariably arises, **"How can I succeed in engineering?"**





I wish I could give them a mathematical equation whose solution would guarantee their success. But I know of no such equation. I have, however, gained some insights about succeeding in engineering that my fellow engineers and I have learned over the years.

I offer 15 insights and hope they will be beneficial in helping young engineers focus and manage their careers.

The background of the slide is a blue-tinted image featuring technical drawings and a pen. On the left, there are sketches of gears and mechanical parts. In the bottom right corner, a silver and blue pen is shown lying on a drawing. The overall aesthetic is professional and technical.

This presentation focuses on 15 vital aspects in engineering that are usually learned after graduation but can make the difference between success and failure in one's engineering career.

If I want to say my opinion very briefly about this presentation, it will be this:

What I Wish I Knew When I Was in University



LEARN TO BE
BUSINESS ORIENTED

- Doesn't mean get an MBA
- Does mean develop a “**business mindset**” that understands:
 - How business works
 - How economics affects engineering decisions
 - How economics affects your customer



EXPECT TOUGH,
MULTI-DISCIPLINARY PROBLEMS

- Problems you'll encounter are tough and more multi-disciplinary than those in college
 - Will require your utmost technical acumen
 - Must draw simultaneously on many disciplines
 - Can't say "This problem isn't in my field" because many problems are caused by a "chain of events"
- So, broaden yourself technically

LEARN TO WORK AND NETWORK IN A NEW ENVIRONMENT



- In a new faster-paced time scale
 - Shorten concept-to-market time, critical path scheduling
- As a team player
 - You can accomplish little by yourself
 - Operate in boundaryless manner, form alliances
 - Rarely is a non-team player honored or promoted
- With good communication skills

UNDERSTAND THE DIFFERENCES BETWEEN ACADEME AND INDUSTRY



- **Academe promotion metrics**
 - Number of archival publications (freedom to publish)
 - Amount of research money brought in
- **Industry promotion metrics**
 - Contribution to the business
 - Engineering or managerial excellence (design, fix problem, beat competition, etc.)
 - Archival publications often mean little (restrictions on publishing)



LEARN TO DIFFERENTIATE
ALL OVER AGAIN

- Learn a new kind of differentiation
 - Differentiating people and differentiating their leadership and the impact of their work in an organization isn't easy, but it is a vital thing to do.
- Identify your strong points, fix your weak ones.
 - Conduct your career with enthusiasm and you will reap a multitude of dividends.

UNDERSTAND THE VALUES,
CODE OF CONDUCT AND CULTURE
OF YOUR COMPANY



- Learn them and live by them
 - honesty, trustworthiness, diversity, conflict resolution, safety, etc.
- Improve them if needed
- Move on if you can't fit in



BE OPEN TO IDEAS
FROM EVERYWHERE

- Attitude, Attitude, Attitude
 - Nourish a positive, receptive attitude
 - A bad attitude hinders you quickly
- Learn to accept right approaches and reject wrong ones regardless of their source.
- Invent something. Make something work (or happen). Be an "idea" person

HAVE UNYIELDING INTEGRITY



- Cheating is wrong whether you get caught or not.
- Character is important and will get you respect.
- Hidden flaws, careless science, lazy analysis can cause:
 - technical embarrassment
 - economic, social, environmental damage to society
 - people's injury or death



- Your manager:
 - Recommends people to promote, determines salary actions, writes performance appraisals, assigns work projects, recommends who to downsize
- If you don't like, respect, admire your boss, then move on to another job. You're wasting your time ... BUT the problem may be YOU.
- Handle your job so it doesn't need your manager's attention. Be a "Can Do" person.

SUPPORT YOUR UNIVERSITY AND YOUR TECHNICAL SOCIETY



- You owe a great deal to your college / university
 - give seminars, talk to students
 - visit the campus, dialogue with the faculty
- Technical societies provide many benefits for you to grow and network.
 - You will have the opportunity to meet and learn from highly skilled engineers, researchers and educators from other organizations.



HAVE FUN
LOVE YOUR WORK

- There are many exciting and challenging opportunities in engineering, so having fun can be easy.



LEARN ABOUT YOUR HERITAGE
AND BUILD UPON IT

- What are the accomplishments of the engineers in your field who have gone before you?
 - Benefit to improving standard of living, safety, etc.
 - Benefit to society
- How will you contribute to and build upon this heritage?



- Primary responsibility rests with YOU because only you know:
 - What do you want?
 - Where are you going?
 - What you are willing to sacrifice?
 - What you are willing to do to get there?
- Neither the company nor your manager will "take care of you".



NEVER STOP LEARNING

- One of the biggest mistakes you can make in managing your career is to think that college 'commencement' means education 'finished'.
- Successful engineers adopt an attitude of life-long learning. There are now so many opportunities available to you that there is no excuse for not continuing to learn.

THERE ARE SOME GENERAL MYTHS



- There are some general myths about career management that need to be dispelled. While all of the myths listed below are not true in all organizations at all times, they are generally valid regardless of your occupation, especially in today's business environment.



myths
1

- Do a good job and the company will "take care of you", or better yet, "take care of you for life".
- **Nonsense.** In reality no one will take care of you. You must take care of yourself. Do an outstanding job, better than anyone else. Even so, the days of companies providing lifelong employment are gone.



myths
#2

- It's not what you know, but whom you know that counts.
- **Baloney.** What you know counts a lot. Whom you know and what they know about you also counts, but what you accomplish counts even more.



myths
#3

- Career planning is my manager's job.
- **No!** Your manager's job is to lead. He or she often doesn't have the time, skill, ability or inclination to manager your career. Your manager could be a mentor and role model (good or bad). Only you know what you want and what you are willing to sacrifice to get it.



myths
#4

- You only get ahead if you work in the current "high visibility" area.
- Actually, it might or might not help you to work in such an area. Diversity in business experience is important. If your skills are better matched to another area, you could have better success there.



myths
#5

- I would rather be lucky than good.
- No! be excellent or outstanding. Luck and timing are important, but your performance is the best influence on both. Results matter — again and again and again.



myths
#6

- Just tell me the career path I need to be on to reach my goal.
- **Sorry!** There is no explicit career path or magic formula. Career management is an art, although central tendencies do exist. Seek help through your network or your human resources representative.

CONCLUSION

Although there are no magic recipes that will absolutely guarantee your success in an engineering career, I do think there are definitive actions you can take that will significantly increase your probability of succeeding.

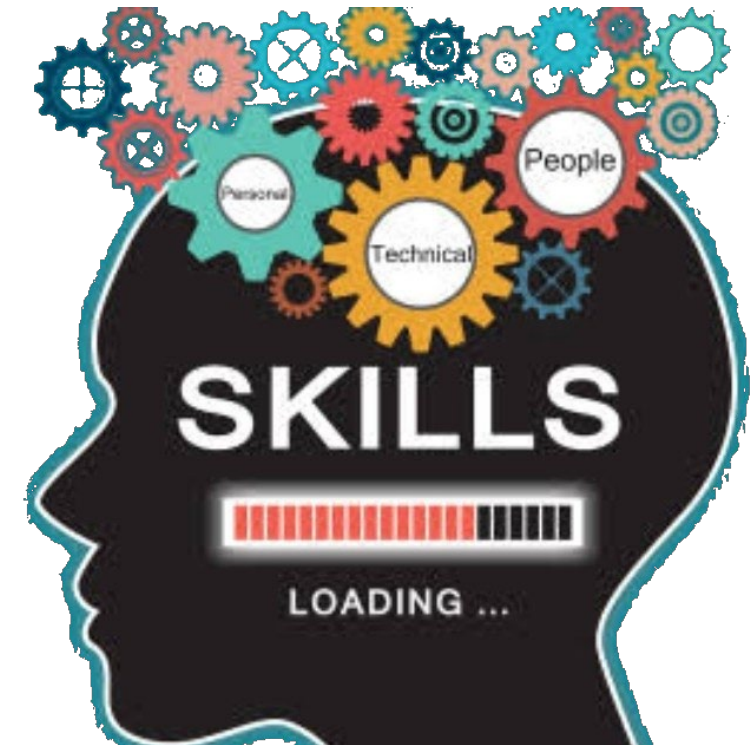
I have listed **15** of these actions and suggest that you study them, discuss them with your manager, teacher or senior engineer/mentor and put them into practice in your career.

It is important to understand that when it comes to evaluating you, your managers will look for these three overarching attributes.

CONCLUSION

1. Technical knowledge and engineering skill

What is the level of breadth and depth of your technical knowledge and understanding and how well do you apply these to provide creative ideas and solutions in support of the business efforts?



2. Teamwork and leadership

How well do you maintain flexible and effective team relationships in accomplishing organizational objectives?
How effectively do you communicate and lead?



3. Execution and Productivity

How well do you apply knowledge, understanding, judgment and initiative across multiple disciplines in planning and executing programs so that your customers get timely results in an efficient manner?





Kamran Khodaparasti

Materials Engineer

Info.



This presentation was developed by Kamran Khodaparasti.

Publication date: July 2024



kkhodaparasti@yahoo.com



kamrankhodaparasti.ir



Kamran Khodaparasti

Ref.



Engineering, What You Don't Necessarily Learn in School,
David C. Wisler

Personal experience