

SECTION I

LEARNING THE BASICS

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CHAPTER 1



LEARNING TO DRIVE YOUR COMMUNICATIONS

Learning to drive your communications means you control powerful forces that impact interpersonal and technical clarity in getting your point across in engineering settings.

Learning to Drive Your Communications

Remember when you learned to drive a car?

You had used your arms and legs before you began driving. You had learned to coordinate your vision with your sensory motor choices before you ever got behind the wheel. But when learning to drive, you were using these capabilities in a context that asked you to grow a new integration of your skills.

If you remember the sharp stopping of the car when you first learned to apply pressure to brakes . . .

If you remember the hard scrape of the wheel grinding the curb when you learned to parallel park . . .

. . . then you have a sense of what it will feel like to practice the engineering communication skills you will learn in this book.

Prepare to feel disoriented.

It means you are actually learning to drive the intention of your communications rather than being driven by them. You are learning to understand your own thoughts, feelings, and behaviors as a communicator. You can master these dynamics, just like you eventually learned to drive a car like it was second nature, through learning our *Communication Microskills Model* Figure 1.1.

COMMUNICATION MICROSKILLS MODEL

Microskills Definition

Microskills are elemental, or subunits, of communication skills. These are labeled on tabs, analogous to DNA base pairs, in our model Figure 1.1. Learning to use them individually and in a variety of combinations allows you to build your DNA of holistic skills as a communicator in a diversity of engineering tasks and settings.

You develop these microskill tabs (sub-units) one-by-one, then combine them into effective, fluent communication skills. You use these distinct subunits, the microskill tabs, alone and in a variety of combinations—creating shared communication strands of information exchange with others, to listen, to anticipate, to predict, to respond, and to become a better engineer.

WHY ARE MICROSKILLS IMPORTANT AS A BASIS FOR COMMUNICATION IN ENGINEERING?

Learning basic units of communication for practice in your profession is important because engineering communication is a complex mix of social dynamics (think about the diversity of people in an organizational context and how they must all work together to develop services and products) and technical expertise (think about analyzing and designing the physical characteristics of products).

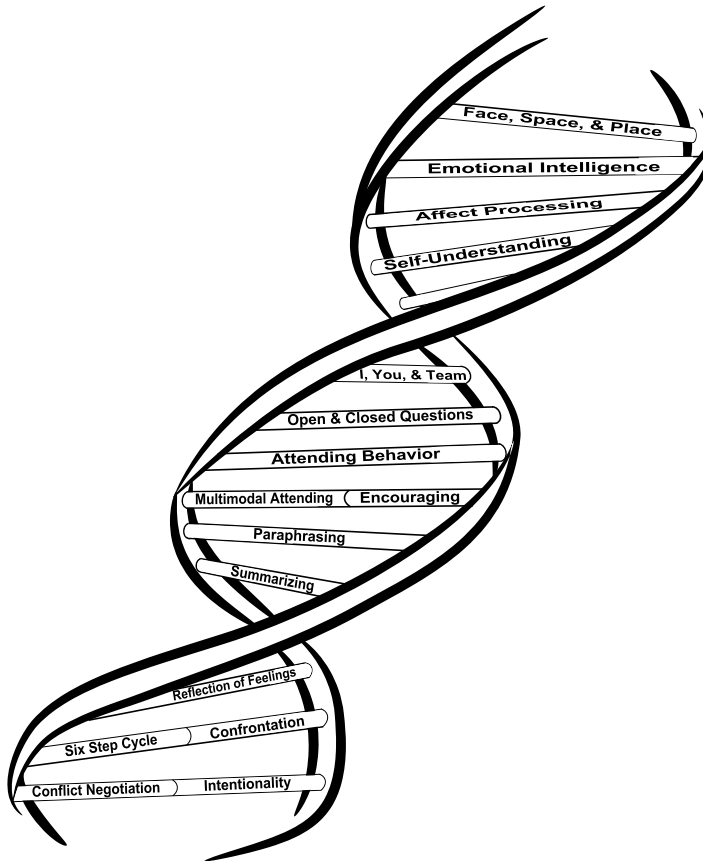


FIGURE 1.1 Communication Microskills Model. Think of the various microskill subunits as analogous to base pairs in a strand of DNA. The microskill base pairs are the essential building blocks for the development of your holistic DNA of information exchange capability in interpersonal and technical engineering settings. We label these microskills as tabs in the model given to you in this book.

The microskill tabs on our model simplify interpersonal and technical exchanges that occur in complex engineering situations. Successful use of microskill tabs individually and in a variety of combinations ensures that engineering ideas, designs, and operations are accurately expressed and received by all professionals involved.

This usage is important to learn because the alternate is letting communication remain an unskilled aspect of engineering practice—and then dealing with the consequences of negative project outcomes that correlate with deficits in professional engineering communication proficiencies.

Negative Project Outcomes Correlate with Deficits in Professional Engineering Communication Proficiencies

Impacts of deficits in professional engineering communication proficiencies were starkly demonstrated in the space shuttle *Challenger* disaster. Top-level decision makers had not been accurately informed of problems with O-ring seals and external sheath joins on the shuttle, even as the countdown to launch commenced. Concerns about the impact of cold weather on these elements during servicing delays on the morning of launch were not communicated adequately by engineers on the project, nor were they given full attention by NASA officials immediately before launch.

Communication that could have prevented tragedy was not expressed or received with enough accuracy to make a difference. The shuttle was engulfed in flames soon after launch, killing all on board, due to an O-ring failure and sheath leaks. Investigations after the event supported the conclusion that flawed interpersonal and technical engineering communication was a significant factor in the deaths of seven astronauts and in subsequent discontinuation of major engineering design contributions to space exploration (McDonald and Hansen, 2009).

While this consequence of deficits in communication proficiencies is especially dramatic, it occurred on a spectrum of interpersonal and technical communication miscues that are a prevalent aspect of the engineering profession. Design failures and subsequent social and professional consequences happen regularly in development and post-completion stages of engineering projects. Failures in interpersonal and technical communication in engineering settings play a significant role in these issues.

Learning to use the Communication Microskills Model is an excellent way to help prevent these issues from impacting your professional practice as an engineer.

HOW DO MICROSKILLS WORK?

When you look at our Communication Microskills Model, you can see the microskill tabs occurring individually and in connection with all the other skills in the helix.

The microskills are similar to the encoding on a strand of DNA because each microskill carries information that shapes its own function and relates to overall communication functions that become holistic interactions.

For example, the microskill tab of I, You, and Team statements helps you make clear statements that are not over-personalized nor overly technical and generalized. Even better, when this microskill tab is combined with the microskill tab of attentive listening behaviors (Attending Behaviors) you are expressing *and* hearing important interpersonal and technical content concerning engineering tasks and project developments.

HOW WILL I LEARN THE MICROSKILLS?

Each labeled microskill tab will be explained in detail in this book. You will be given examples and questions with each microskill tab to demonstrate how to generalize this knowledge and practice these skills in real engineering settings.

Each microskill tab will also be demonstrated in combination with others, allowing you to form new and ever-expanding communication proficiency structures that now have their own properties that fit a variety of engineering contexts. Scenarios and dialogs in the chapters show you how individual subunits combine and work together in holistic interpersonal and technical engineering information exchanges.

These exchanges are invaluable in moving your projects forward and preventing them from being mired in emotions and behaviors that block technical progress.

WHAT'S IN IT FOR ME?

The examples and exercises help you learn how to put together the pieces of effective engineering communication. You will become an effective engineering communicator and you will be a better engineer. You will learn how to engage others. You will learn how to listen to others. You will learn how to manage conflict and influence others in highly constructive, repeatable communication exchanges.

Throughout this book, reading dialog demonstrates the presence of these skills and prepares you to recognize their presence in yourself and others. Defining them and then understanding their contextual integration provides deeper learning to understand them more completely.

WHY THIS WORKS

The basis of why this will work for you is because our model represents elemental communication basics that form the foundation of powerfully effective engineering communication proficiencies.

Microskills of communication become well-defined engineering skills when you learn to use them to

- get the *attention* of others,
- *engage* others with you,
- get your *point across*,
- *persuade* others,

to move engineering functions toward engineering outcomes that are accurate and successful.

Use these microskills for

- *providing the controls* for the engineering communications that *you are driving*
- *allowing yourself to think, feel, and respond* with interpersonal *intentionality* and technical excellence.

THE IMPORTANCE OF A PRACTICE-BASED MODEL

The engineering communication microskills in this book will serve you well if you let them, and if you take the time to use them. *You unlock and increase their potential each time you practice them in authentic situations.* Upon completion of this book, you will be able to

- learn and master intentional engineering communication through microskills,
- understand communication microskills,
- apply communication microskills in engineering contexts, both with individuals and teams,
- draw out individual and team issues and problems through the use of a basic listening sequence,
- develop strategies leading to individual and team change and action,
- learn and master the influencing microskills of confrontation and interpretation,
- listen, influence, and structure effective communication exchanges,
- predict the likely impact of your efforts in structuring communication exchanges.

A recommended way to use this book is to first focus on a single microskill. Read about it and develop a cognitive understanding and then,

practice. You can only expect to become better at communication if you actively practice. This is more than simply reading about the microskills and doing them once, and thinking that this is easy. You need to continually practice in authentic situations to understand the effectiveness of your application of the microskills. The examples and exercises teach you how to put together the pieces of effective engineering communication to make this learning through practice happen.

The initial chapters in this book cover *Learning the Basics* related to all communications, from Shared Communications to Your Natural Style, Self-Understanding, Emotional Intelligence, and Affect Processing. All of these integrate to give you a crucial understanding of the interpersonal field in which all engineering technical and nontechnical exchanges occur.

Chapters in the section, *Taking it to Work*, help you to build the basics, to form a bridge between you as a *technical engineering* communicator and you as an *interpersonal* communicator.

Practicing these skills repeatedly points you toward intentionality in your technical and nontechnical communications. This intentionality is expanded in the third learning level of the book, putting you on a path toward intentional competency.

Chapters in the section, *Making it Real*, model intentional competency for you. They show you how to keep technical and interpersonal communication exchanges constructive even when colleagues have widely divergent opinions on technical approaches or interpersonal styles and even when projects run into technical or schedule glitches.

Chapters in the section, *Taking the Lead*, provide you with additional skills to practice when worst-case scenarios occur in engineering settings. Knowing how to deal with these scenarios gives you an *engineering communication intentionality* that makes you not only a valued player but a leader in your profession. Some of these scenarios involve confrontation and include situations like a peer or teammate who won't cooperate or perform, a supervisor who has no management skills, or a project design that evolves intractable technical and schedule glitches near the end of a project cycle.

The chapters on using communication skills throughout *Conflict Negotiation* lead you toward this mastery. They give powerful fluency and effectiveness to your engineering communications. These chapters model engineers communicating effectively producing effective engineering solutions—even during moments of conflict, intense creativity, interpersonal differences, and intractable project-related troubleshooting.

When you have practiced these skills in authentic engineering settings and experienced their positive impact on your communications and engineering outcomes, you are an *intentional engineering communicator*. You can now intentionally drive engineering tasks and goals and fulfill

engineering proficiency potentials in ways that meet and exceed expectations consistently.

The final level in mastering effective engineering communication skills to produce effective engineering outcomes is *intentionally modeling* engineering communication competency, not just for yourself, but for those around you—and you become an Intentional Engineer. Because you are now *driving* your engineering communications rather than being *driven* by them, you are driving your responses to the technical and interpersonal communication inputs of others rather than being driven by them. Your technical and interpersonal content, your emotional and behavioral responses to others in your communication content, becomes a model for, and teaches others, how to drive effective communication and effective engineering outcomes, as well.