Communication is inarguably a vital component to effective teaching. Students must receive information in one form or another if any learning is to take place. Instructors delivering information to students in a classroom setting communicate their messages to students through a variety of devices: lecture, slide shows, and videos to name a few. During the course of a class, students will receive more than just the verbal information from their instructor – they are also registering non-verbal signals and vocal intonation that help them process information. Literature on non-verbal communication and vocal intonation greatly expands the potential for effective teaching in the classroom.

Instructors have traditionally only focused on preparing the verbal portion of their lectures. Miller (2005) and Pease and Pease (2006) bring to light why it is necessary to consider more than just the words coming out of the instructors’ mouths. Hartley and Karinch (2007) define the different components of communication as verbal, vocal, and nonverbal. Verbal communication constitutes one’s word choice. Vocal communication includes intonation, pitch, and tempo. Nonverbal communication constitutes all other pieces of communication, such as posture, facial expression, and the way one dresses. Both the books by Miller and Pease and Pease bring forth a reminder of the findings of anthropologists Ray Birdwhistell and Albert Mehrabian. Birdwhistell and Mehrabian published the bulk of their works in the 1960s and 1970s and established that “the verbal component of face-to-face conversation is less than 35 percent and that over 65 percent of communication is done non-verbally.” Further, if you consider all components of communication – verbal, vocal, and nonverbal – Mehrabian’s study concludes that vocal and nonverbal communication together account for 93 percent of the total message communicated by vocal intonation and nonverbal communication, leaving only seven percent of a message communicated through verbal means. Birdwhistell called his studies on non-verbal communication “kinesics,” and focused the importance of his work on his estimates that the average person only speaks for about ten or eleven minutes a day with the average sentence taking about 2.5 seconds, while humans are capable of making and recognizing about 250,000 facial expressions. Of great significance to Pease and Pease was the concept that non-verbal and vocal cues needed to be taken in clusters and in context. For instance, a person sitting with their legs crossed could be defensive or that could be how they sit comfortably for their norm. If that same person is sitting with crossed legs and arms folded, they could be defensive, or if they are sitting outside in the winter, they could just be cold. The more a person understands how to read
nonverbal communication, the better they are able to control their own in order to achieve a desired effect or emphasis.

In their book, *I Can Read You Like a Book*, Hartley and Karinch (2007) start by teaching how to read the different types of communication. As with the Pease and Pease book, Hartley and Karinch focus on reading clusters of signals. Humans as a species have some signals that are generic and apply trans-culturally—smiles, for instance typically mean someone is happy. Then, one must transition to understanding an individual’s behavior when taken in context of cultural or group normative behavior. For instance, one would be able to differentiate whether someone is adapting to stress or putting up barriers by a specific gesture or posture based on their understanding of the existing group dynamics. Finally, Hartley and Karinch apply their techniques to what is known about a specific person— their baselines and idiosyncrasies. Once someone is trained in understanding how other people communicate through vocal and nonverbal communication, they can transition to applying this skill by controlling their own vocal and nonverbal communication to elicit a specific reaction from the person or people they are dealing with. Some of the tools Hartley and Karinch attempt to build are having the ability to connect with people, or build rapport; using regulators for subtly controlling a conversation, which would help an instructor assert themselves as a leader in the classroom; and, controlling one’s adaptors and barriers to send specific messages to your audience. Having these tools in an instructor’s kit bag greatly enhances their ability to reach students on both an individual and class basis.

Students’ learning styles within a discipline typically have characteristic trends. Richard M. Felder (2005) has published several articles on his learning styles index, initially developed with his colleague Linda K. Silverman (1988) on the tendencies of students’ predispositions for specific learning styles. His learning styles survey currently tests predispositions to active versus reflective learning, visual versus verbal learning, sensing versus intuitive, and global versus sequential learning. As a chemical engineering professor at North Carolina State University, Felder has focused his studies primarily on engineering undergraduate students. His 2005 research shows a strong to moderate predisposition among engineering students toward visual versus verbal learning. The findings of this study indicate that it is important for the instructor of undergraduate engineering education to place additional emphasis on preparation of the nonverbal and vocal intonation elements of class. The visual learner will best remember the nonverbal cues, thus, an engineering instructor can increase long-term learning for their students by increasing the students’ exposure to nonverbal classroom exercises. This is at odds with the traditionally preferred teaching method for most engineering instructors. However, there is a new movement afoot in the civil engineering education field—the Excellence in Civil Engineering Education (ExCEEd) program, sponsored by their professional society, the American Society of Civil Engineers (ASCE).

This teaching model was originally taught in a workshop in 1999. It has been taught by ASCE continually since its inception, and is currently taught semi-annually in ASCE workshops, typically to 30 participants at each conference. Arguably, its strongest proponent is the
Department of Civil and Mechanical Engineering at the United States Military Academy. The philosophies of developing better teachers within the ASCE ExCEEd model are based on Lowman’s two-dimensional model of teaching developed in his 1995 book, Mastering the Techniques of Teaching. Figure 1 is a graphic representation of Lowman’s two-dimensional model. Lowman builds his scale of poor teachers (the poorest is classified as inadequate), and great teachers (the greatest classified as a complete exemplar), on their abilities in generating intellectual excitement and building interpersonal rapport with their students. Lowman gives priority to intellectual excitement as the more important of the two dimensions of effective teaching. Gaining a mastery of building intellectual excitement and developing interpersonal rapport are critical to mastering the ExCEEd Model, which derives its six main elements for developing the teacher as a positive role model from Lowman’s two-dimensional model.

The ASCE ExCEEd Model was developed by Allen Estes, Ronald Welch, and Steven Ressler (2005) at the United States Military Academy in an effort to transform the way the faculty taught engineering. Estes, Welch, and Ressler recognized the value behind Felder’s research to better understand how engineering students learned, and married this knowledge to Lowman’s model for effective teaching. The result is the ASCE ExCEEd Model for teaching, designed specifically to give engineering instructors new tools to help make them good teachers who can teach in a way that also meets the needs of engineering students and how they learn best. Of the ASCE ExCEEd Model’s six elements (structured organization, engaging presentation, enthusiasm, positive rapport with students, frequent assessment of student learning, and appropriate use of technology), delivering an engaging presentation and enthusiasm are most directly related to an instructor’s ability to master nonverbal communication and vocal intonation. An engaging presentation and enthusiasm are both designed to build an instructor’s ability to display and build intellectual excitement. Within the element of an engaging presentation, effective communication extends from clear handwriting, clear enunciation, and adequate volume to varying pitch and speed of delivery – vocal intonation, and using gestures effectively – nonverbal communication. Exemplary presentations incorporate “humor, drama, and good storytelling.” The instructor uses their nonverbal skills to force the students to engage in the presentation by maintaining a high degree of contact with them. This can be accomplished through many nonverbal techniques, such as the instructor’s physical position in the classroom and deliberate movement throughout the classroom. Effectively reading the students’ body language, and then being able to respond appropriately with their own, the instructor can greatly
enhance their ability to keep the students engaged in their presentations. Keeping the students engaged appropriately is critical to retention and stimulating critical thinking – a logical byproduct of intellectual excitement.

The other ASCE ExCEEd Model element that is critical in building intellectual excitement is enthusiasm. An instructor’s passion for the material is often contagious. Enthusiasm adds focused energy and increases the instructor’s presence in the classroom. Nonverbal communication is critical in conveying enthusiasm to the students. A practiced instructor can use their enthusiasm to generate tension, humor, or intrinsic interest by how they position themselves. For example, standing more upright and leaning slightly forward with raised eyebrows while talking about how a seemingly innocuous topic might be to saving lives, such as understanding river routing, might generate dramatic tension in the class and allow the class to share in the instructor’s joy of discovery, potentially ending with whether or not their engineered structure would save a town from flooding. Understanding and mastering the nonverbal and vocal skills that will enable the effective instructor to convey the depth of their intellectual excitement is essential – if the students do not perceive an instructor’s intellectual excitement, they have no external motivation to build their own intellectual excitement.

As these articles and books convey, the preponderance of communication is through nonverbal communication and vocal intonation. An instructor’s effective mastery at reading nonverbal cues from their students, and then using their own nonverbal communication and vocal intonation to place particular emphasis, or draw interest from their students can make them much more effective communicators. This is particularly important to the instructor of undergraduate engineering education, whose students are largely visually stimulated and active learners. These references are consistent in conveying the ideas that improved communication comes through practice, and that most of the communication that occurs in a classroom is through vocal intonation and nonverbal communication. By inference, the largest gains an instructor can make in effective classroom communication are by mastering their nonverbal communication and vocal intonation skills.

Annotated bibliography


The seventh in a series of articles detailing the principles and techniques that formed the ASCE EXCEED Teaching Model. This teaching model is transforming engineering education in a number of universities around the country. The target audience is instructors with three years or less teaching experience, and the intent of the workshops is to generate a paradigm shift in how instructors approach teaching engineering in an attempt to make the learning come to life for the
students. The force behind this methodology is effective communication paired with an instructor’s willingness to become a more effective nonverbal communicator.


This was the first of five articles that Felder published on the Felder-Silverman Learning Style Model. This article defined the model and clearly established the different learning style domains that students are predisposed to. The article also identified the teaching practices appropriate for meeting the predominant needs of the undergraduate students, while reaching out to the full spectrum of styles. Felder discusses the significance of using visual cues to enhance a student’s ability to process information and learn more effectively. In 2002, Felder updated the article with a preface that eliminated one of the original sets of dimensions. The inductive versus deductive dimensions were eliminated because Felder found sufficient evidence to suggest that all undergraduate students should be taught in the inductive style. He also identified this as problematic, as most traditional college courses teach using deductive methodology.


Felder and Spurlin published several articles together validating the Felder-Silverman Learning Styles model. In this article, they focused primarily on validating the study among engineering undergraduates, but also validate the study with non-engineering students. The results of the studies are very revealing for instructors of undergraduate engineering students, in that there is a strong predisposition in engineering students as visual learners. Additionally, in engineering classes that are taken by non-engineering students, such as a fundamentals of engineering course, an instructor will be challenged in teaching these students differently as they have a significantly different predisposition toward verbal learning, and may be challenged to grasp the visual and math-based concepts typically found in engineering.


This book is focused on teaching people how to read the nonverbal communication and vocal intonation cues of others in order to more fully understand their communication. Further, this book teaches individuals how to control their own nonverbal communication and vocal intonation to send more focused and deliberate communication to others. This book contains a number of different techniques for those interested in streamlining their communications skills.


This book is foundational to many teaching philosophies in practice today. Its focus on gaining a better understanding of the dynamics between student-teacher interactions and how to nourish the classroom relationships to optimize a student’s learning experience helps clarify the importance of communication. Understanding how intellectual excitement produces a more effective teacher allows an instructor to focus their communication on reinforcing their intellectual excitement. While this book is foundational to a number of teaching philosophies, Lowman has stopped updating the material, and some of the content is beginning to become
dated. Currently, the basic communication requirements are still valid, but as technology continues to evolve, communication techniques will necessarily continue to evolve. As this evolution occurs, Lowman’s book should be continually evaluated to determine if it is still suited for applicability.

This book is a good introductory book for an instructor on the topic of nonverbal communication. It is based on solid research that is accepted by educators, primarily the works of Ray Birdwhistell and Albert Mehrabian. It does not get as detailed on techniques as Hartley and Karinch or Pease and Pease; however, it is a much quicker read than the other books, and would provide a new instructor with a quick introduction to the value of nonverbal communication and some basic techniques to employ as they begin to build their skills as effective communicators.

The techniques and skills developed through this book are detailed and will greatly enhance one’s ability to communicate effectively through nonverbal means. Like the book by Hartley and Karinch, this book goes into a detailed background on the context of nonverbal communication and how to holistically evaluate another’s nonverbal communication. Additionally, the book also teaches how to apply the skill by having an awareness of one’s own actions and optimizing communication by only conveying the nonverbal messages intended.

This book does not focus directly on the importance of nonverbal communication or vocal intonation. However, the entirety of the book is dedicated to providing techniques to transform the classroom experience into one that is engaging and attractive to the students, much as a stage performance would be. It provides methods for planning the class, warming up for class, questioning, leading discussions, creating energy, developing drama through curiosity and discovery, and similar activities. It provides instructors with many different opportunities to utilize their nonverbal skills. Additionally, it has an extensive annotated bibliography which has substantial references in both educational theory and application of the teacher performances.