AC 2011-450: UNDERSTANDING YOUR STUDENTS' NONVERBAL COMMUNICATION: A PRIMER FOR THE NEW ENGINEERING EDUCATOR

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Student Nonverbal Communication in the Classroom

Abstract

This document includes a general overview of nonverbal communication and discussion of cultural and gender-based influences. A detailed discussion of common classroom nonverbal dynamics and challenges common to the identification and interpretation of those conditions are also identified. In addition, details are provided related to an on-going study of student nonverbal communication in the classroom.

While the information contained within this document will be particularly useful to individuals new to teaching, all engineering educators are likely to find this information beneficial to their classroom interactions.

Introduction

As educators we often look for confirmation that our students are grasping the concepts under discussion. This is frequently referred to metaphorically as a light bulb in or over a student's head. However, by nature, not all students are animated in a way that allows educators to identify their nonverbal communication.

Many educators receive formal or informal training in the nonverbal communication that we, as instructors, intentionally or unintentionally exhibit in the classroom. However, rarely does that training include discussion of how to interpret the nonverbal communication of our students. In an environment where educators are consistently attempting to better understand and better communicate with our students, it should be critical that we develop the skills necessary to identify and interpret student nonverbal communication.

Research Question and Method

The authors were motivated to execute this study as a means of improving their own nonverbal sensitivity and nonverbal interpretation acumen. The research question around which this study was developed was: "What is the content of the available literature specific to identifying and interpreting student nonverbal communication in a classroom setting?" Building from the research question, the method of investigation utilized in this study included a fairly comprehensive investigation of the published literature (including texts, journals, and magazines) through the application of various databases and discussions with academicians associated with the field of communication. Literature was reviewed in the general realm of communication, specific nonverbal communication publications, classroom instruction, body language, and where possible, the intersection of these individual topics.

Overview of Nonverbal Communication

Communication is a field of study that, rather ironically, uses terminology that is inconsistent and at times contradictory. The literature surveyed during this study utilized a range of syntax

and meaning. Thus, setting the stage for subsequent discussion, this section offers a concise overview of nonverbal communication.

Miller (2005a) provides a rather simplistic view of nonverbal communication as communication without words. Zoric, Smid et al. (2007) state that "non-verbal (sic) communication refers to all aspects of message exchange without the use of words"(pg. 161) and goes on to say that "it includes all expressive signs, signals and cues (audio, visual, etc.)" (pg. 161). Nonverbal communication includes the tone, loudness, speed, and timing of the words used in communication, but it does not include words and their associated meanings. Thus, when communication occurs, in a face-to-face context, it can and likely does include more than just words. In fact, of all the physical activity and parameters that are involved with communication, including the use of words, intonation, pace of speech, facial expressions, gaze, gestures, etc. (Neill & Caswell, 1993), the overwhelming majority is done in a nonverbal manner. Reportedly, 93% of all face-to-face communication is nonverbal (Leathers, 1992; Miller, 2005b).

One notable exception to the generalized definition of nonverbal communication is sign language. While not involving pure verbalization, sign language is a form of communication that incorporates nonverbal cues commonly associated with basic communication. Knapp & Hall (1992) and Zoric, Smid et al. (2007), astutely identify sign language as a true form of communication without verbalization; it is not, in fact, classified as nonverbal communication.

Nonverbal communication is learned well before a child begins the process of verbal communication (Miller, 1988). The role of nonverbal actions is to assist in the communication process in ways that simple verbalization cannot. Words, alone, have limitations (e.g., challenges of effective communication via email). Trehnolm & Jensen (2008) note that nonverbal actions modify and refine concurrent verbal messages and help to regulate the flow of interaction. Leathers (1992) also notes that nonverbal actions are more efficient and more accurate than verbalization. Nonverbal message are considered to be relatively genuine and free of deception (Leathers, 1992; Miller, 2005b). Nonverbal signals can also be used to express feelings that are too disturbing to state otherwise (Miller, 2005a).

There is a wide range of reported nonverbal communication taxonomies (Smith, 1979). For example, Knapp & Hall (1992) classify nonverbal communication as appearance, proxemics, body motion (gesture, posture, touching, facial expressions, eye behavior), and paralanguage. While Miller (2005a) states that nonverbal communication includes facial expressions, eye contact, touching, tone of voice, dress, posture, and spatial distance. Perhaps one of the most comprehensive and scientific categorizations of nonverbal communication is offered by Zoric, Smid et al. (2007).

- Chronemics – Timing of verbalizations and pauses.
- Haptics – Contact and deliberate touch between individuals.
- Kinesics – All forms of body language and body movement, including facial expressions, eye movement, gesture, and posture.
- Oculesics – Intentional and unintentional eye contact in the act of communication.
- Olfactics – The influence of odor.
- Physical Appearance – Characteristics of the body, clothing, hairstyle, etc.
- Proxemics – Consideration of personal space and arrangement of physical items.

- Silence – The absence of verbal and nonverbal communication.
- Symbolism – Meaning associated with symbols.
- Vocalics – Vocal impacts on the act of speaking, to include tone of voice, timbre, volume, and rate of speech.

While it is useful to consider and discuss each category of nonverbal communication individually, it is important to realize that they rarely occur alone. Zoric, Smid et al. (2007) describe nonverbal conditions occurring in clusters (multiple displays at one time).

Nonverbal cues are exhibited both consciously and unconsciously (Miller, 2005a, 2005b; Zoric et al., 2007). Some nonverbal behaviors are learned (Zoric et al., 2007), such as a wink; while others are innate, such as a blush. As an educator, looking for a student's nonverbal cues, it is important to realize that unconscious actions and reactions are often the manifestation of a statement that a student feels uncomfortable otherwise expressing.

A discussion of nonverbal cues must include recognition of the influence of culture and gender on both the sender and the recipient. These variables are embedded in both the bias used in interpretations made by an instructor in the classroom and in the outward projection of the student. That is, as an instructor, our perspective on the interpretation of observed body language could be biased by our own culture and gender (perceiving that others exhibit the same body language with the same implied meaning that we do). Further, as the processor of a student's exhibited body language, an instructor will need to consider the cultural and gender-based influences on a student-by-student basis. The topics of culture and gender are addressed in the following two sections.

Cultural Influences on Nonverbal Communication

Hartley & Karinch (2007) describe culture as "nothing more than accepted social norms for a group" (pg. 38). Matsumoto (2006) notes that culture plays a significant role in molding our nonverbal behaviors. As instructors, it is imperative that we understand and recognize cultural influences on nonverbal communication. The information provided herein, regarding cultural influence, is not intended to be a complete analysis of all potential cultures, but rather an illustration that such cultural influences do exist.

In the process of making meaning of behavior, it is important to identify nonverbal cues that are considered universal, versus those that carry specific cultural meaning. In general, spontaneous or unconsciously exhibited facial expressions are nearly universal (Matsumoto, 2006; Pease & Pease, 2006). For example, the easily recognized smile is a common expression of pleasure among all cultures (Neill & Caswell, 1993; Pease & Pease, 2006).

While some nonverbal cues may have universal meaning, the ease with which they are exhibited is also a cultural variable. For instance, the facial expressions associated with disgust, sadness, fear, and anger are common between Americans and Japanese, but Japanese individuals believe that it is unacceptable to display such negative emotions in public (Neill & Caswell, 1993). Americans are more open in their expression of emotions than many other cultures (Riggio & Feldman, 2005).

The nonverbal process of looking directly at an individual, gazing, is also a cultural variable. While listening to another speaker, White Americans make eye contact 80% of the time (Suinn, 2006). Further, while speaking, White Americans only make eye contact 50% of the time (Suinn, 2006). Conversely, African-Americans make more eye contact while speaking and less eye contact while listening (Suinn, 2006). Across many cultures, a gaze is associated with dominance, power, or aggression (Matsumoto, 2006). In many Asian cultures it is considered rude to make even brief eye contact with a person of higher social status (Suinn, 2006). While in Arab cultures individuals tend to gaze more directly and for longer periods than other cultures (Matsumoto, 2006).

Interpersonal spatial boundary expectations also differ between cultures. For example, Latin Americans tend to interact and communicate in closer proximity than do Europeans (Matsumoto, 2006). Further, Italians interact in closer proximity than do both Germans and Americans (Matsumoto, 2006).

Physical gestures, with hands and arms, are another common difference between cultures that can lead to nonverbal miscommunication. Matsumoto (2006) identifies several gestures that are commonplace and socially acceptable in one culture, but are considered obscene in another culture. The "OK" sign, common in many English speaking countries, means zero or worthless in France, means money in Japan, and is a derogatory statement and/or obscenity in Mediterranean, Arab, and Latin American countries (Pease & Pease, 2006). From one country to another, two fingers in a V formation can mean victory, peace, two, five (roman numeral), or a obscenity (Neill & Caswell, 1993; Pease & Pease, 2006). The height at which individuals hold their hands while gesturing is also a cultural variable. Individuals with British and Germanic background gesture with their hands held low in comparison to individuals with Mediterranean or Latin backgrounds (Hartley & Karinch, 2007).

Cultural norms influence behavior at multiple levels; including the nonverbal cues that individuals exhibit and the way that we interpret nonverbal cues made by others. Riggio & Feldman (2005) discuss the influence of culture on the encoding (sending out) and decoding (interpreting) of nonverbal behavior. As instructors, Suinn (2006) says that we must be aware that our own cultural backgrounds are what we use to make meaning of behavior in the classroom.

Gender Influences on Nonverbal Communication

The following paragraphs summarize the nonverbal communication differences between genders as reported in various literature sources. The intent of discussing these differences is not to suggest that one gender is stronger at communication than another. Rather, it is to raise awareness to perceived classroom conditions. In light of the prior section, it is also appropriate to note that gender characteristics presented herein are specific to Americans.

Women tend to use more vigorous facial expressions and are more animated with head, hand, and arm gestures during communication than men and are more likely to engage in self touch and touch other individuals during communication (Hall, 2006b). Women also exhibit a higher level of what Hall (2006a) calls interpersonal sensitivity. Accordingly, Hall (2006b) suggests

that women tend to more readily notice, are better at decoding, and are more influenced by nonverbal cues than are men.

In general, men tend to be more restless (foot and leg movement, shifting, fidgeting), assume more expansive stances (arms and legs further apart), and recline when seated more than women (Hall, 2006b). Men also establish and maintain a larger interpersonal space than women do (Hall, 2006b). Neill & Caswell (1993) state that men tend to be more assertive in their communication. Hall (2006b) notes that men's verbalizations tend to be louder, lower pitched, and contain more speech disturbances (e.g., ums, repetitions, and incomplete sentences).

Neill & Caswell (1993) emphasize that the most significant difference between men's and women's nonverbal communication is frequency. That is, they suggest that the type of nonverbal communication utilized is similar between genders, but the frequency with which those cues are used does differ. Women tend to smile more frequently than men (Hall, 2006a, 2006b), gaze more often and for longer periods of time (Hall, 2006b). Nodding, as a specific form of nonverbal cue, is more commonly exhibited by women in classroom interactions (Helweg-Larsen, Cunningham, Carrico, & Pergram, 2004).

Why Nonverbal Communication is Important in the Classroom

In the context of classroom instruction, the relatively small percentage of communication that occurs verbally will primarily stimulate cognitive meanings (cognitive domain) for the student, while the more pervasive nonverbal communication (~93% of all communication) stimulates the students' feelings and attitudes (affective domain) about the material (McCroskey, Richmond, & McCroskey, 2006). Thus, given the potential impact on student learning that nonverbal communication has, it would seem important that all instructors be mindful of their personal outward nonverbal projection, as well as observation of student nonverbal cues.

Communication, when done properly, is a two-way interactional process (Suinn, 2006). That statement remains valid in the classroom, where, as instructors, we strive to communicate clearly and effectively with our students. Radford (1990) declares that effective communication is critical in the classroom environment. Miller (1988) states that "knowledge is transmitted through effective communication and nurtured by skillfully sending and receiving message…" (pg. 23). However, even in a student-centered, active learning environment, a large portion of verbal and non-verbal communication is generated by the instructor and intended for processing by our students. Through the interpretation of our students' nonverbal cues, this seemingly one-way classroom communication can become a more interactive, two-way process. Students' ability and comfort with processing instruction can be interpreted from their nonverbal cues, which, in turn allows the instructor to advance the discussion based on the type of observed cues.

Angelo & Cross (1993) state that "through close observation of students in the process of learning…teachers can learn much about how students learn and, more specifically, how students respond to particular teaching approaches" (p. 3). The nonverbal clues that our students provide in return are critically important, real-time feedback that influences our subsequent communication (Suinn, 2006) and allows us to alter our course of action if needed (Davis, 2009; Neill & Caswell, 1993). Webb, Diana et al. (1997) states that "from observation and

interpretation of students' body language and facial expressions, the perceptive teacher can decide whether there is a need to check for comprehension, provide more or a different kind of instruction, or assign more practice" (pg 89). Thus, faculty can use classroom observations of nonverbal cues "to refocus their teaching to help students make their learning more efficient and more effective" (Angelo & Cross, 1993, p. 3).

Angelo & Cross (1993) discuss the observations that instructors should perform in the classroom:

> "As they are teaching, faculty monitor and react to student questions, comments, body language, and facial expressions in an almost automatic fashion. This "automatic" information gathering and impression formation is a subconscious and implicit process. Teachers depend heavily on their impression of student learning and make important judgments based on them…" (pp. 6-7).

Neill & Caswell (1993) point out that inexperienced instructors "…show an unfortunate and almost total lack of awareness of the extent or function of non-verbal pupil behaviors…" (pg. 55) and suggests that such classroom awareness only develops with experience. In a study by Webb, Diana et al. (1997) "expert" and "non-expert" teachers were evaluated for their ability to judge student comprehension based on visual, nonverbal behavior and "expert" or more experienced teachers were in fact more accurate.

To an inexperienced instructor, classrooms can appear to be an overwhelmingly busy environment. If active learning conditions are utilized, the classroom truly is busy. However, it is the experienced instructor that has developed the ability to dynamically mental-multi-task in the classroom; speaking, observing conditions, reacting, interacting, and facilitating active learning. That is a skill that cannot be readily taught, but rather must be learned through experience. Radford (1990) notes that "observation is a discrete teaching skill that needs to be learned" (pg. 37) and "teachers learn to observe in the classroom on their own with little direction or training" (pg. 37). As Webb, Diana et al. (1997) state, "Accordingly, expert teachers are able to attend to myriad and complex information that they can organize and interpret, and they appear to perceive and understand students, social information, and classroom events in a qualitatively different manner than less experienced teachers" (pg. 89).

A failure to observe and recognize that a student is struggling with a concept can lead to bored and frustrated students. "Only when we can accurately perceive what is occurring can we reflect upon what the student is learning and upon what interests and feelings they bring with them to the learning situation" (Radford, 1990, p. 38). Thus, there is a clear need for instructors to be sensitive to nonverbal cues as a means of real-time assessment. Angelo & Cross (1993) state that while other forms of classroom assessment may be more accurate, they simply are not timely enough.

What Makes Classroom Nonverbal Communication Difficult to Observe and Interpret

It is significantly easier for instructors to consciously and unconsciously send nonverbal cues than it is for them to identify and interpret the nonverbal cues of our students (Trenholm & Jensen, 2008). By comparison, nonverbal messages are less tangible and can be more difficult to interpret than verbal messages (Thompson, 1973). In addition, as Knapp & Hall (1992) note,

"people differ markedly in their skills in judging and using nonverbal cues" (pg. 476). It is entirely likely that one instructor may be more skilled or sensitive to vocalics, while another instructor is more sensitive to kenisic facial expressions. Much of that sensitivity to nonverbal cues comes from an instructor's experience, as well as the instructor's gender and cultural background.

As noted previously, the classroom is also a very dynamic environment. It can be difficult for an instructor to track even the most primary classroom activities, let alone pick up on nonverbal cues made by a single student. Often the signals that predict trouble are subtle and can be lost in the mass of nonverbal activity. Radford (1990) suggests that to truly attempt to observe and process everything that occurs in a classroom would result in an instructor being "paralyzed by continuous conscious analysis." The previously mentioned mental multitasking required of an instructor requires a sense of comfort in the classroom environment and confidence in the subject matter.

Adding to the difficulty of identifying nonverbal cues is the awareness that students have about their own nonverbal projection. Without fully realizing it, students proactively seek to mask their nonverbal cues. This is particularly true of cues that would suggest lack of understanding. Unfortunately, in many academic environments, it is considered a weakness to reveal confusion in front of one's peers. Men are significantly more likely to adopt a "poker face" in the classroom than their female counterparts (Hall, 2006a; Helweg-Larsen et al., 2004). To overcome such an atmosphere and encourage both verbal and nonverbal requests for assistance, instructors must proactively create a safe, nonjudgmental classroom environment.

The fact that nonverbal cues typically occur in clusters (Zoric et al., 2007) can clarify or confound our observations. For example, a student who sits far away from the instructor, projects his or her legs to side, slouches, and crosses his or her arms over the chest should be identified as unengaged in the learning process. However, a student that is seated near the front of the classroom, is seated erect, frequently yawns and glances at the clock, may be bored with the material or may actually enjoy the class, but be looking forward to his or her nap immediately after class. It can be difficult for instructors to not immediately assume that they are interpreting observations correctly. Rather, it is important to look for unifying threads and to place observations in context (Knapp & Hall, 1992). It is also important to realize that not all observed nonverbal cues are a reaction to the course material or our performance as instructors. The strained look on a student's face maybe confusion, or it could also be a reaction to a bad lunch, a personal relationship issue, or the person seated next to them that is wearing an excessive amount of cologne/perfume. We must keep in mind that students have lives beyond the classroom walls and those lives influence their mindset throughout the day.

Miller (2005b) notes that "no formalized reliable means has been developed to identify and interpret all nonverbal behaviors" (pg. 74). Further he notes that student nonverbal cues are "autonomic, idiosyncratic, and ambiguous" when not considered in context. Thus, it is important not to jump to conclusions, over-sterotype, or make broad generalizations. Consideration must be given to culture, gender, and a student's pattern of normal behavior (Hall, 2006a; Miller, 2005b).

Content and Limitations of the Cognate Literature

The study of nonverbal communication is still considered to be relatively "new." Radford (1990) notes that while college-level course work has been offered in nonverbal communication since the 1970s, the majority of communication studies still focus on verbal and written communication. Thompson (1973) referred to nonverbal communication as one of the least studied human activities.

During a fairly extensive review of the literature, a significant volume of nonverbal communication material was identified. This content ranged from college-level texts, to handbooks focusing on nonverbal communication research, to guides intended for interrogators with an interest in reading body language. Some of that literature had very specific discussion of both cultural and gender differences in nonverbal communication. There appears to be a rather limited volume of literature that focuses on the classroom. Of the classroom related literature that was identified and reviewed, the vast majority had a primary focus on the nonverbal cues generated by instructors and received by students. While it should not be suggested that this is unimportant, the literature appears to largely overlook the need for two-way communication in an active learning environment. The one exception to this is the text by Thompson (1973) that broadly discusses both instructor and student nonverbal cues. Unfortunately, Thompson's text was published in 1973 and has not been revised to capture more recent research on the topic of nonverbal communication. What little recent literature there is that mentions interpretation of student nonverbal cues is focused on classroom environments with verbally challenged students (e.g., English as a second language) (Gregersen, 2005). There is a clear awareness that instructors need to have an ability to identify and interpret student nonverbal cues (McCroskey et al., 2006; Miller, 2005a, 2005b; Radford, 1990; Smith, 1979; Trenholm & Jensen, 2008), but the literature appears to do little more than advocate for awareness, and provides very limited classroom specific direction.

The various pieces of the nonverbal student communication puzzle appear to be available, but each is currently unconnected. There is scholarly literature on the subjects of active learning environments, classroom communication, and interpretation of nonverbal cues. However, there appears to be a lack of literature that specifically discusses how instructors, in an active learning environment, can identify and interpret their students' nonverbal cues to assist communication and facilitate learning.

Research in Progress

A single investigation conducted by Webb et al. (1997) is the only identified literature that focused specifically on quantifying the ability instructors have to accurately interpret student nonverbal communication. In this study, they hypothesized that more experienced instructors could more accurately interpret student non-verbal communication. To test this hypothesis, they utilized a "2x3 (Discussion Type: Discussion with Feedback vs. Discussion Only) x (Experience Level: Expert vs. Advanced Beginner vs. Novice)" experiment. The population of instructors were categorized as "expert" teachers with 5 or more years teaching experience, "advanced beginner" teachers with one to two years experience, and "novice" teachers which had only student-teaching experience(cite) (Webb et al., 1997). The population of instructors was equally

sorted into two groups. Video only(no sound) clips of 4th graders answering questions were shown to each group of teachers and they were asked to rate the level of comprehension of the students, as well as their personal confidence level in their own response (Webb et al., 1997). One group was given feedback on the correctness of their response after each question, while the other was not. The teachers then repeated the process with a second set of clips but neither group was given feedback. In general, Webb et al. noted that "Expert" teachers were most capable of interpreting nonverbal communication as expected, but they also found interesting discrepancies among the rest of the participants especially with respect to the effect of feedback on overall performance. It is important to note that the above study used 4th grade students and elementary school level instructors.

The authors of this manuscript are in the process of replicating the Webb et al. study in a collegiate atmosphere, using freshman students as the video subjects and undergraduate engineering instructors as the evaluators. We hypothesize that "Expert" instructors will perform the best just as in the former test, but are interested to see if variations will appear between the Webb et al. population and the populations of college instructors.

Conclusion

Nonverbal communication is a two-way process that is generated and interpreted by both instructor and student. The benefits for an instructor to develop a strong sensitivity and ability to interpret student nonverbal communication should be self evident. "A good teacher is a good listener, not only to words being spoken, but also to silent messages that signal agreement/disagreement, attention, inattention, interest/boredom, and the desire of the student to be heard" (Miller, 2005b, p. 67). Both the instructor and the student stand to gain from improved classroom communication. Understanding nonverbal cues requires background knowledge and teaching experience. It is easy to be misled or misinterpret cues that are not filtered for context, culture, gender, and personal bias. The available literature focusing on nonverbal classroom communication is significantly partial toward projected cues of the instructor and provides surprisingly little content specific to decoding student generated cues.

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