

EVERYDAY WORKPLACE ETHICS FOR THE MILLENNIAL BUSINESS AND ENGINEERING
UNDERGRADUATE STUDENT: A SITUATED LEARNING MODEL

by

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ABSTRACT

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Undergraduate ethics instruction in business and engineering can be broadly divided into two models – disciplinary ethics (integrated within a course where discussions about ethics pertain to a particular profession or discipline) and standalone ethics (where the concept of ethics and ethical conduct are discussed in broad, theoretical terms). While both these models have educational value, they have not been able to help the millennial undergraduate student with everyday routine ethical decision making that they might encounter in the workplace. This is largely because both these models do not consider the organizational or the cultural context (the context in which learning will eventually be used) in their discussions. Ignoring the cultural context, say situated learning theorists, limits the transfer of learning to practice. Because formal, classroom education, unlike apprenticeships (how learning traditionally took place before colleges and universities came on the scene), separates the learning from the doing, deliberate pedagogical methods need to be used that help connect knowledge to practice.

In this study, I investigate the merits of using cognitive apprenticeship, a situated learning model, as a way to help business and engineering undergraduate students make a connection between classroom learning of everyday workplace ethics and its application in their future places of employment. Situated learning, sometimes referred to as situated cognition or everyday cognition considers learning as it happens in everyday authentic circumstances making use of concrete tools (psychological and technical resources) provided by the cultural context to acquire and apply knowledge. These cultural tools or cultural referents, as Choi and Hannafin (1995) calls them, can especially be helpful to the new millennial professional in identifying and dealing with routine ethical scenarios in the workplace.

The study was conducted at a large, urban, mid-western public university in the US. The study participants included graduating seniors of a supply chain class and capstone students of a mechanical engineering class. The results of this partly quasi-experimental and partly qualitative study indicate that students who had prior work experience and prior ethics instruction found the situated learning experience equally enabling as did those who did not. The quantitative results indicate that there was a statistically significant increase in the students' understanding of everyday ethical scenarios and the qualitative results overwhelmingly indicate that the students valued the situated instruction because it gave them an understanding of 'real-world' application of everyday ethics.

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To

My mother. Thank you mee for everything.

None of what I have accomplished would have been possible without you.

And to my grandfather for being a pillar of support.

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CHAPTER 1: INTRODUCTION

BACKGROUND OF STUDY

Undergraduate ethics instruction in business and in engineering can be broadly divided into the following two categories (Carlson & Burke, 1998; Haws, 2001; Herkert, 2000; McDonald, 2004; Nicholson & De Moss, 2009; Rabins, 1998; Waples et al., 2008)

- Standalone, semester long, often mandatory ethics courses: These courses generally include formal ethical theories (usually grounded in philosophy) where the concept of ethics and ethical conduct are discussed in broad, theoretical terms. Discussions in such a model of ethics instruction are decontextualized or in other words not situated in the learners' chosen field of study (Herkert, 2001; McDonald, 2004). According to Markel (1994), they throw little light on the "practical problems students will confront when they begin their careers".
- Ethics instruction at the disciplinary level (e.g. accounting ethics and engineering ethics): In this model, discussions about ethics pertain to a particular profession or discipline. Disciplinary ethics is often integrated throughout the curriculum or discussed as a separate module. Fictitious scenarios as well as real world cases from business and industry are typically used to build awareness about ethical issues that pertain to a particular profession. Professional codes of conduct are sometimes used to guide discussions (Carlson & Burke, 1998; Catalano, 2004; Early & Kelly, 2004; Hashemian & Loui, 2010; Matherne, 2006; Slocum et al., 2014).

Using case studies, especially high profile cases such as Enron or the Challenger space shuttle at best attract the attention of students, Herkert (2000) says, and do little in terms of application to everyday ethical situations students might encounter in the workplace. Professional codes that are sometimes used to guide discussions of cases may not be of much help either in terms of guiding one's ethical decision making. This is because professional codes are overly general (Buchholz, 1989). Generalized statements in the codes, Buchholz (1989) says, "are usually abstract, high-minded and largely universalizable and the danger in universalizing is that ethical grandstanding becomes easy. Generalized codes suggest a moral grandeur that has little to do with the *workday world* (emphasis added). Impenetrable, unreasonable and unclear codes can be a refuge for the cloudy thinkers or indeed for the unthinking". Professional codes, Buchholz goes on to say, "must have relevance *in the day-to-day life of the profession* (emphasis added). Confronted by an ethical dilemma, the professional should be able to find specific guidance in the official code. That guidance, insofar as is humanly possible, must be straightforward and directive". But most often they are not. Let us, for instance, look at the National Society for Professional Engineer's Code of Ethics. Canon 5 reads "Engineers, in the fulfillment of their professional duties, shall avoid deceptive acts" and Cannon 6 reads "Engineers, in the fulfillment of their professional duties shall conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession". These nonspecific professional codes offer little help to employees, much less to young, inexperienced employees, looking for immediate guidance in dealing with an ethical scenario at work.

Not surprisingly then, studies reveal that when professionals are confronted with an ethical dilemma at work, they look for guidance from within their place of work rather than from professional codes. Employees turn to their supervisors, management, and/or their company documents such as company policies and employee handbook for guidance (Dragga, 1997; Ethics Resource Center Survey, 2011). In a study conducted by Dragga, 30 of the 48 technical communicators he interviewed from seven companies in Texas said that they turned to their colleagues or their supervisor for guidance in ethical decision making. The top three issues that the technical communicators sought advice on were interpersonal relations, legal issues, and company policies on ethics. None of the study participants, “referred to a professional code of conduct or solicited advice from a professional association”. According to Dragga (1997), “professional associations, professional codes of conduct have little or no influence on the ethical deliberations of technical communicators on the job”.

Standalone and disciplinary ethics instruction then, have educational value, but are of little help to students when it comes to using that knowledge in dealing with routine ethical scenarios that they might encounter in the workplace. This is exemplified by the findings of a study conducted by Robert McGinn, an engineering professor at Stanford University; a rare study that investigated the relevance or value of classroom learning of ethics in the workplace. Professor McGinn conducted a study that revealed “significant gaps between the ethical realities of engineering practice and preparation for those realities in engineering schools” (as cited in Colby & Sullivan, 2008). The study sought

the feedback of both practicing engineers as well as engineering students. Most practicing engineers said that “they regularly face ethical issues in their work, but did not feel they were adequately prepared to handle those issues”. The engineering students for their part reported that “they believed that it was important to be professional as it is to be a technical expert but only a small percentage said that they had learned anything specific from their engineering courses about what being a professional entails” (as cited in Colby & Sullivan, 2008).

Li and Fu (2012), in their recent study corroborate the students’ feedback from Professor McGinn’s study. According to them, “critical gaps exist” in the current models of engineering ethics instruction which insufficiently prepare students for the “fast changing environment”. These views are mirrored in business ethics instruction scholarship as well (Nicholson & DeMoss, 2009, Waples et al., 2008). According to McDonald and Donleavy (as cited in McDonald, 2004), “ethics involve a high level of abstraction that prohibits effective learning...ethics training can have little effect and students are unable to transfer their ethical skills into the business environment”.

In an effort to increase the transferability of classroom learning of ethics to the workplace, Waples et al. (2008) in their meta-analytic study say, business ethics instruction has recently started to pay attention the organizational context. For instance, Matherene et al. (2006) share their experiences of setting up an ethics instructional module in their undergraduate capstone strategic management course in

an effort to prepare or socialize students for ethical decision making in the professional world. The module consisted of an interactive session (an informal working lunch) with professionals from the local community. Case vignettes involving ethical dilemmas (e.g. downsizing) were developed from “popular business press articles of companies facing ethical dimensions of business decisions” and these formed the basis of the discussions. Persons (2009), in her study, developed ethical scenarios that correspond to nine areas of corporate code of ethics to test the behavioral intentions of accounting majors to violate the code. The findings of her study revealed that 50% of the students in her study had unethical intentions particularly in the following six areas – “not reporting unethical behavior of a close friend, using company computer for personal purposes, accepting a lunch invitation from a supplier, using company copy machine for personal purposes (using a big discount to induce customers to buy more than they can promptly resell to reach target sales), and selling an employer’s stock on the basis of inside information”.

Students, particularly undergraduate students who “lack experience with business situations involving ethical dilemmas” (Matherne et al., 2006) and who have little life experiences to draw from (Ethics Resource Center Survey, 2011) are more likely to benefit from an instruction that makes a connection between classroom learning of ethics and the target context of application. Ignoring the organizational or cultural context (target context or the context in which learning will eventually be used), say

situated learning theorists Jean Lave and Etienne Wenger, will limit the transfer of learning to practice.

While educators are beginning to realize the value of considering the organizational context in business ethics instruction, in order for these socialization efforts to be effective, the instruction must also consider the elements of the cultural or organizational context in which the learning will be used. According to Lave and Wenger (1991), merely placing learning content in situated contexts is insufficient. Instead, an effective situated learning activity will take into consideration the relations among people, tools, and the activity itself of the target context. Hansman (2001), another proponent of situated learning, points out that “All human activities take place in a cultural context. These interactions and activities are mediated through the use of tools, either technical (machines, calculators, computers) or psychological (language, writing, strategies for learning) provided by the culture”. Because “practice, knowledge and culture are interdependent, learning must involve all three. Otherwise, students may pass exams, but still not be able to use a domain’s conceptual tools in authentic practice” say Brown et al., (1989).

In this study, I investigate the value of the use of situated learning model of instruction in orienting the millennial undergraduate student to everyday ethical professional practice. The cultural elements that form a part of the study include

1. The organizational codes of ethics (henceforth organizational codes) of two specific companies as instructional content
2. Experienced practitioners from these companies who act as the facilitators of the content and who are also members of the students' chosen professional field
3. Everyday ethical scenarios (e.g. confidentiality and data privacy, electronic communication) developed in consultation with the practitioners that are situated in the organizational as well as the professional context.

Organizational codes, as cultural tools, explain terms and concepts as it pertains to ethical behavior and professional conduct, outline the consequences of non-compliance, explain processes and procedures to follow while reporting a misconduct, and point to people and material resources that employees can take advantage of. According to the Ethics Resource Center, a nonprofit organization that conducts research on ethical standards and practices in private and public institutions,

A code of conduct is intended to be a central guide and reference for users in support of day-to-day decision making. It is meant to clarify an organization's mission, values and principles, linking them with standards of professional conduct. As a reference, it can be used to locate relevant documents, services and other resources related to ethics within the organization. A code is an open disclosure of the way an organization operates. It provides visible guidelines for behavior. A code is also a tool to encourage discussions of ethics and to improve how employees/members deal with the ethical dilemmas, prejudices and gray

areas that are encountered in everyday work. A code is meant to complement relevant standards, policies and rules, not to substitute for them.

Because organizational codes (or related documents) can be specific and directional, they can be especially helpful to young, inexperienced employees in identifying ethical scenarios and in ethical decision making.

The experienced professional (who belongs to the students' major field of study and who is from the organization whose codes are being used) helps in providing the practical perspective. He explains the meaning of and rationale behind the different organizational codes with supporting examples from within his organization and the profession. The professional makes explicit to the students his thought processes behind his assessment of handling of various situations that involve ethics. Such a model of instruction, where the experienced practitioner voices his thought process to the novice professional, in situated learning literature is referred to as cognitive apprenticeship. The process of combining the learning principles of traditional apprenticeship, where an experienced professional assists a less experienced one by way of demonstration, support and examples, with the modern pedagogical practice of engaging students in a classroom with problems situated in real-world contexts is referred to as cognitive apprenticeship, a type of situated learning. (Cash et al., 1997; Dennen & Burner, 2007).

The participants in my study were graduating seniors of a supply chain class and mechanical engineering students in a capstone design class. Since this study is arguing

for an ethics instruction that would help orient the millennial undergraduate student to everyday ethical decision making in the workplace it was important that this study was conducted with students who were about to graduate and enter the workplace so they can readily make the connection between what is being learned and how it will be applied.

Studies reveal that the Millennials are the most likely to engage in misconduct in the workplace (Persons, 2009; Ethics Resource Center, 2009, 2011). The most common areas of misconduct centered around misuse of technology, conflict of interest, and sharing of company confidential information on social networking and other public platforms. Therefore, I focus on the following six areas of organizational codes in my study

1. Confidentiality and data privacy
2. Electronic communication
3. Conflict of interest
4. Official records and records management
5. Organizational resources to consult when in doubt
6. Reporting procedures

An experienced supply chain professional from Harley Davidson Motor Company used his organization's code of ethics as a reference point to explain the above six codes to the supply chain students. Likewise, an experienced mechanical engineering

professional from GE Healthcare Company used his organization's codes as a reference point to explain the above codes to the mechanical engineering students (large, well established companies tend to have elaborate organizational codes).

My research, therefore, has a dual focus: 1) content of instruction (organizational codes of conduct) and 2) the method of instruction (the industry representative facilitating the content by using cognitive apprenticeship method). These will be addressed by the following research questions

1. What is the students' level of understanding of the six areas of organizational codes of ethics and of the terms associated with the codes (for example, official records and intellectual property) prior to the intervention and after the intervention?
2. What are the students' attitude towards the situated nature of the content and the fact that it was facilitated by an experienced professional from the industry?

THEORETICAL FRAMEWORK

I use Jean Lave and Etienne Wenger's Situated Learning Theory to inform and guide my entire study. Since this study is aimed at millennial undergraduate students, I also review literature on Millennials and their characteristics. And, since I test students' understanding of the organizational codes at a basic level or Bloom's level 1 and level 2 of reasoning, I briefly review literature on Bloom's Taxonomy to help structure my pre-test and post-test (it was important to first assess the extent of their

knowledge/awareness of the six organizational codes – studies talk of behavioral intent on the part of the millennials to engage in unethical behavior in the workplace but they do not say if the intent stems from a lack of awareness and understanding of the organizational codes).

SIGNIFICANCE OF THE STUDY

Several studies have pointed to the limitations of the existing models of undergraduate ethics instruction and the need to better prepare students for practical, everyday ethical decision making in the workplace (Colby & Sullivan, 2008; Herkert, 2000; Matherene et al., 2006; Persons, 2009). My study is an attempt to address this need to connect knowledge to practice. My study will also add to the rather meager scholarship in undergraduate business and engineering ethics instruction that examines the value of considering the organizational context.

Further, to the best of my knowledge, no study has investigated the merits of situated cognition (incorporating elements of the cultural/organizational context in the instruction) in orienting the millennial business and engineering undergraduate student to routine ethical decision making in the workplace. Situated learning was chosen as the model of instruction because it caters to the traits and the learning styles of millennial students – their need for structure and explicit guidance in the accomplishment of a task and their limited experience in ethical decision making in professional contexts. Situated learning uses specific examples situated in authentic contexts to orient/socialize

students to the various ethical scenarios they will encounter in the workplace, it provides opportunities to students to learn from experienced members of the community of practice they will be entering, and situated learning points the novice professional to cultural/organizational resources that they can consult when caught in an ethical dilemma. Incorporating cultural/organizational elements in classroom instruction give students an awareness of the proactive steps they can take to function as an informed professional in their future places of employment. Also, given the rapidly changing economic and work conditions, my study is an attempt to look at business and engineering ethics instruction in new, practical ways.

Because professional codes of conduct are broad and vague and therefore, of little or no help to the millennial student, this study uses organizational codes, which are often specific and directional, as a means to educate students about ethical professional conduct. The learning content (organizational codes) are not only situated in an organizational/cultural context but also in the student's professional field. For example, supply chain students learn about different conflict of interest situations a supply chain professional faces within an organizational context.

This study was aimed at graduating seniors; students who were poised to enter the workplace or to put it in situated learning terms, students who were on the periphery of their practice. The timing/positioning of the instruction was deliberate because students

can readily make the connection between classroom learning and how it can be applied in the workplace.

Finally, while my study focuses on the business and engineering fields, this model of ethics instruction can be used in any field that prepares students for careers in the government sector, business or industry.

CHAPTER 2: LITERATURE REVIEW

SITUATED LEARNING THEORY

Situated Learning Theory says that instruction must be informed by the context in which the learning will be transferred to or applied. This learning theory was proposed by Jean Lave and Etienne Wenger whose aim was “to show how learning actually happens” (Hughes et al., 2013). Learning, Lindeman (as cited in Hansman, 2001) says, best happens through situations rather than subjects. Long before schools, colleges, and universities came into existence, learners learned by observing the master craftsman or tradesman. In such a learning situation, learning and practice went hand in hand and the need to transfer knowledge from a learning context to a work context never arose (Brown et al., 1989). But because contemporary educational practices separate the learning from the doing, instructors need to find ways to show how classroom learning can be applied in real-world contexts. “Separating knowing and doing ignores the way situations structure cognition” say Brown et al. (1989). Learning that occurs within the context of application is considered more likely to result in improved practice (Dennen & Burner, 2007). According to Duncan (1996), closer the match between the learning situation and the ultimate workplace situation, the easier the transfer of knowledge will be.

Formal or classroom learning approaches assume that “knowledge is held in the minds of individuals and thus can be eminently transportable” to work contexts (Quay, 2003).

Echoing Quay’s (2003) observations, Suchman (as cited in Henning 2004) says formal

learning believes that, “mentalistic formulations of the individual are translated into plans that are the driving force behind purposeful behavior. Plans, refer to a view of action that assumes that the actor has used past knowledge and a reading of the current situation to develop a plan from within the actor’s individual cognitive process to intelligently meet the demands of the situation”. But when confronted with real-life situations, learners often are not able to readily draw from past learning and apply the learning in coherent ways to address the needs of a real-life work situation. For this reason, classroom learning is often described as abstract, decontextualized, and symbolic. “Typically, formal education emphasizes general, abstract abilities based on the assumption that students can generalize these abilities for their use” (Choi & Hannafin, 1995). Increasingly, however, research shows that general skills often do not promote knowledge transfer (Henning, 2004; Hughes et al., 2013; Lave & Wenger, 1991). This is because there are “significant differences between how students think and use their knowledge in a classroom environment and how they think and act in everyday circumstances” (Choi & Hannafin, 1995).

This ‘everyday thinking’, in situated learning literature, is often referred to as everyday cognition or situated cognition. Cognition, according to Choi and Hannafin (1995), “is an intricately interwoven and conditionally-sensitive process referencing the individual’s knowledge, experience and the problem to be solved”. But merely placing learning content in situated contexts is insufficient say Lave and Wenger (1991). Instead, an effective situated learning activity will take into consideration the relations among

people, tools, and the activity itself of the target context. According to Hansman (2001), “All human activities take place in a cultural context with many levels of interactions, shared beliefs, values, knowledge, skills, structured relationships, and symbol systems. These interactions and activities are mediated through the use of tools, either technical (machines, calculators, computers) or psychological (language, writing, strategies for learning) provided by the culture. These tools ensure that linguistically meanings have shared social meanings”. “Learning is an everyday event that is social in nature because it occurs with other people; it is ‘tool dependent’ because the setting provides mechanisms (computers, maps, measuring cups) that aid, and more important, structure the cognitive process; and finally, it is the interaction with the setting itself in relation to its social and tool dependent nature that determines the learning” (Wilson as cited in Hansman, 2001). “Practice, knowledge and culture are interdependent. Learning must involve all three. Otherwise, students may pass exams, but still not be able to use a domain’s conceptual tools in authentic practice” (Brown et al., 1989).

“Situated learning methods encourage everyday cognition by grounding learning activities in authentic contexts. Because authentic tasks use practical situations, knowledge is said to have meaning because it reflects the ambiguity and imprecision inherent in everyday circumstances. Therefore, situated learning environments are more likely to support transfer to real-life problem solving” (Choi & Hannafin, 1995).

“When dealing with real problems, learners reference their personal experiences and strategies which evolve through continuous self and context referencing. Students learn

to use their knowledge flexibly as a tool to deal with every day, as well as, novel situations” (Choi & Hannafin, 1995). A key word to note here is ‘evolve’. With every experience, the learner cultivates new mental models which are an amalgamation of, as discussed above, knowledge, tools, and interactions with the cultural elements the activity is embedded in. Choi and Hannafin (1995), call the ability to flexibly adapt old knowledge to new situations cognitive ergonomics and this type of learning, situated learning theorists argue, can be induced via situated learning approaches.

Studies of expert practitioners show that they integrate relevant chunks of knowledge, drawn from contextual resources, and past experiences to address an issue at hand (Choi & Hannafin, 1995; Kerka, 1997). According to Choi & Hannafin (1995),

Practitioners’ activities are situated in the cultures in which they work, within which they negotiate meaning and construct personal understanding...Likewise, in everyday situations, people use concrete referents and tools extensively, referencing thought and knowledge to specific contexts. People acquire practical knowledge and skills, continuously through day-to-day experience and observation. They evolve an understanding of how and when to deploy their knowledge and skill within these contexts...Transfer is facilitated by the availability of powerful concrete instances. Rather than have students apply purely logical, abstract rules to solve problems instead, if they were given opportunities to extract and combine key elements from the domain knowledge as well from the real-world situation then they will learn how to better analyze, approach and solve

problems. Recent research suggests that when general principles of reasoning are taught together with self-monitoring practices, problem-solving as well as metacognitive skills are more successfully transferred. According to Winn, flexibility in performance is engendered not by placing students in all situations in which their knowledge and skills will be applied but by teaching at a level of generality that allows application in multiple settings...Generality is indeed achieved by varying the situations in which students practice what they have learned". By providing varied content reflecting similar concepts, students learn different ways knowledge can be used and begin to generalize accordingly.

Content is informed by the context or in other words, context provides support for the use of learning content. "Context acts as a guide for the student to engage in an activity by providing the student a sense of situational intent. The authentic context, both cues the learner to situational resources and serves as an advance organizer for related problem solving contexts" (Choi & Hannafin, 1995).

Authentic context refers to a community of practice (e.g. marketing, investment banking) and situated learning is concerned with incorporating all aspects of this community of practice. In situated learning, people learn as they begin to participate and interact with members of the community and become increasingly involved with the community's history, assumptions, sociocultural values and rules (Lave & Wenger, 1991; Quay, 2003; Morrell, 2003).

The central aim of situated learning is to help those on the cusp or the periphery of a profession to move towards a fuller, more developed form of participation. Situated learning then is a form of enculturation or socialization into a community of practice. This learning approach recognizes the formal teacher as well as the expert practitioner and other members of the community as playing important roles in the process of enculturation into a community (Quay, 2003). This process, of the novices engaging in learning activities that will help them gradually move on an inward trajectory towards full participation, is referred to as legitimate peripheral participation.

Legitimate Peripheral Participation

“Legitimate peripheral participation provides a way to speak about the relations between newcomers and old-timers, and about activities, identities, artifacts, and communities of knowledge and practice. It concerns the process by which newcomers become part of a community of practice” (Lave & Wenger, 1991).

Fig 1: Levels of Participation

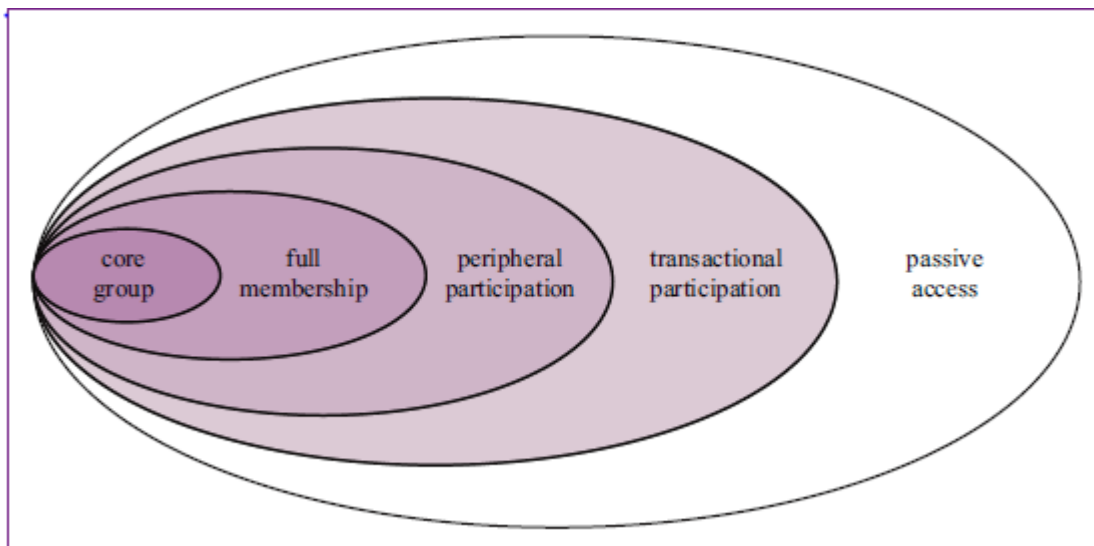


Figure 1, as depicted in Karallis (2010), shows the five levels of participation.

1. The core group: consists of the expert practitioners of the community
2. Full membership: refers to active and committed members or professionals
3. Peripheral participants: refer to members of a community but those who enjoy limited authority because they are new or because they do not yet share a sense of commitment to the community. “Newcomers are ‘authorized’ in practice by the experienced professionals of the domain to carry out increasingly complex projects based on the rate at which the newcomers accept and absorb the knowledge of the community of practice” (Karallis, 2010).

The two outermost levels of participation refer to those who have an incidental or external relationship with the community.

According to Hansman (2001), the process of legitimate peripheral participation is characterized by both the modeling of mastery of practice (learning content/ domain knowledge) and the process of gaining mastery (the learning process). “When the mentor’s thinking is made accessible to the learner, and the learner’s thinking is evident to the mentor, it is increasingly possible to improve both action and the underlying process. Modeling the thought process underlying the performance such as explaining why certain procedures are in place or why certain tools and implements are used for specific functions helps learners integrate *what* occurs with *why* it occurs” (Choi & Hannafin, 1995).

Modeling in situated learning can take two forms – via communities of practice or cognitive apprenticeships, both of which are inspired from traditional apprenticeships.

Community of Practice

“A community of practice is a site of learning and action where participants coalesce around a joint enterprise as they develop a whole repertoire of activities, common stories, and ways of speaking and acting. Communities of practice constitute reality in a particular manner and encourage specialized ways of acting and thinking” (Wenger as cited in Morrell, 2003).

The term community of practice was coined by Lave and Wenger while they were “studying apprenticeship as a learning model” (Wenger, 2011). Practice refers to engagement in situated behaviors that presume not only activities but also a historical and structural context for work. Tools used in practice such as documents, policies etc. by organizational members are both the products of participation as well as central elements in participation (Knapp, 2008).

According to Wenger (1998), communities of practice are characterized by the following features

1. **Mutual engagement:** collaborative relationships built through participation.
Members are bound by a common sense of purpose. There is, therefore, a strong internal sense of identity

2. Joint enterprise: a shared understanding of what constitutes the 'domain' of the community; of what gives meaning to members' actions
3. Shared repertoire: resources (e.g. routines, vocabulary, procedures, knowledge etc.) that are used routinely in the pursuit of the joint enterprise.

These characteristics make communities of practice a social learning entity. A community of practice acts as a forum or a network where novices have the opportunity to share and create knowledge with active, experienced practitioners. "Communities of practice are formed by people who engage in a process of collective learning in a shared domain of human endeavor: a tribe learning to survive, a band of artists seeking new forms of expression, a group of engineers working on similar problems, a clique of pupils defining their identity in the school, a network of surgeons exploring novel techniques, a gathering of first-time managers helping each other cope. In a nutshell: Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, 2011).

Cognitive Apprenticeship

Cognitive apprenticeship, a term coined by Collins et al. is another situated learning approach and like community of practice is inspired from traditional apprenticeship. According to Dennen and Burner (2007), "Cognitive apprenticeships often naturally occur within a community of practice". In cognitive apprenticeship, "instructors describe out loud what they are thinking and doing and why they are doing what they are doing"

(Duncan, 1996). The instructor then gives the learners an opportunity to perform the activity while articulating out loud their thought processes. This process of “experts modelling the strategies and activities needed to solve problems and then letting the learners approximate doing the activity” (Kerka, 1997) is referred to as cognitive apprenticeship. The process of the instructor verbalizing his/her thought process “provides the only available window into the mind of the expert” says Duncan (1996). According to Collins et al., cognitive apprenticeship model of learning can be especially helpful in classroom situations where learning at the site of community of practice is not possible.

In this model of learning, “Experts coach learners with appropriate scaffolds (physical aids and supporting materials, feedback, hints/prompts etc.), gradually decreasing assistance as, through continued practice, learners internalize the process by constructing their own knowledge base and understanding” (Kerka, 1997). Cognitive apprenticeship or cognitive modelling allows experienced members to share tricks of the trade with newer members.

"Apprenticeship is a traditional method of teaching trades through modelling, coaching and fading (gradually removing support and guidance to learners as they develop proficiency in the subject/activity). It is a natural style of learning for many people” (Collins et al. as cited in Cash et al., 1997). Collins et al., suggested that “contemporary classroom instructional methods be combined with the concept of apprenticeship. The

age-old apprenticeship learning principles (modelling, coaching, fading) of on-the-job training were combined with the modern pedagogical practice of engaging students with problems situated in real-world contexts” (as cited in Cash et al., 1997).

According to Collins et al. (1991), in ancient times, teaching and learning, in fields that varied from painting and sculpting to medicine and law, was accomplished through apprenticeships. In modern times, the apprenticeship model of learning has been replaced by formal schooling. Some key differences between formal schooling and apprenticeship method of learning are

- Apprenticeship involves learning a physical activity. But in schooling, much of the learning that takes place is intangible or intellectual in nature. Therefore, the practice of comprehending and problem solving as practiced by the instructor is not obvious or observable to the student and vice versa.
- In apprenticeship the different processes, stages or phases of an activity are visible. For example, learners learn to piece together pieces of materials under the supervision of an expert tailor. But, in classroom learning, the processes and strategies of thinking used by the instructor are often not invisible - “the students are unable to ‘observe’ the tacit processes the instructor uses while solving a problem”. Therefore, students are limited to using “formulaic methods for solving ‘textbook’ problems or in the development of low-level subskills in relative isolation... When they encounter problems that fall outside familiar patterns, students are often at a loss for what to do. In other cases, students fail

to use resources available to them to improve their skills because they lack models of how to tap into those resources”.

Cognitive apprenticeship, then, is a model of instruction that works to make thinking visible. There are three important differences between traditional apprenticeship and the kind of cognitive apprenticeship proposed by Collins et al. (1989)

1. In traditional apprenticeship, the process of carrying out a task to be learned is usually easily observable. In cognitive apprenticeship, one needs to deliberately bring the thinking to the surface, to make it visible. The teacher’s thinking must be made visible to the students and the student’s thinking must be made visible to the teacher. By bringing the tacit process of thinking and problem solving out into the open, students can observe, enact, and practice them with help from the teacher and from other students.
2. In traditional apprenticeships, learning is completely situated in the workplace. Learners are motivated to work and to learn the different components of the task, because they realize the value of the finished product. They are able to retain the knowledge and skills they require to complete the task because they have seen the expert’s model of the finished product and therefore, are able to understand and appreciate how the different components eventually come together to make the whole. But in school, teachers are working with a curriculum that is often separated from real-world contexts. In cognitive apprenticeship, then, the challenge is to situate the abstract tasks of the school

curriculum in contexts that will help students make the connection between the learning and the doing.

3. In traditional apprenticeship, the skills to be learned are part of the task itself. In other words, in traditional apprenticeship, it is unlikely that students encounter situations in which transfer of knowledge and skills is required. The tasks in schooling, however, demand that students be able to transfer what they learn to workplace contexts. In cognitive apprenticeship, the challenge is to present a wide range of tasks, varying from systematic to diverse, simple to complex, so as to help students see the similarities and differences between learning situations and to help them create mental models that will allow them synthesize different learning components.

Collins et al. (1991) point out that “cognitive apprenticeship is not the only way to learn. Reading a book or listening to a lecture are important ways to learn, particularly in domains where conceptual and factual knowledge are central. However, even in domains that rest on elaborate conceptual and factual underpinnings, students must learn the practice or art of solving problems and carrying out tasks. And to achieve expert practice, some version of apprenticeship remains the method of choice”.

“Both cognitive apprenticeships and communities of practice can provide adult educators with tools to redesign learning environments so that newcomers can legitimately and peripherally participate in authentic social practice in rich and

productive ways. In short, situated learning models make it possible for learners to ‘steal’ the knowledge they need and proactively prepare to become full members” (Hansman, 2001).

Summary and Conclusion

- According to situated learning, learning that occurs within the context of application is more likely to result in transfer to the workplace
- An effective situated learning activity will
 - be grounded in authentic contexts
 - take into consideration the relations among people, tools, and the activity itself in the authentic context
- Context acts as a guide for the student to engage in an activity by providing the student a sense of situational intent. The authentic context, both cues the learner to situational resources and serves as an advance organizer for related problem solving contexts
- Authentic context refers to a community of practice and situated learning is concerned with incorporating all aspects of this community of practice
- The central aim of situated learning is to help those on the cusp or the periphery of a profession to move towards a fuller, more developed form of participation
- In cognitive apprenticeship, a situated learning approach, instructors describe out loud what they are thinking and doing and why they are doing what they are doing

Thus, situated learning is a contemporary theoretical approach to learning (Karalis, 2010). Situated learning theory says that learning is a form of socialization into a community of practice. *Learning should not just be about learning about the practice but also learning to be a practitioner.* Context or situatedness involves a consideration of the cultural, historical, and institutional factors of the target context in the learning situation and for this reason, situated learning approaches are referred to as holistic. “Closer the match between the learning situation and the ultimate workplace situation, the easier the transfer will be” (Duncan, 1996).

CHARACTERISTICS OF MILLENNIALS

Workplace professionals often complain of a lack of professional conduct on the part of the Millennials and their inability to comprehend confidentiality and privacy issues and their need for quick rewards with little effort. These unique characteristics, of what has come to be known as the millennial generational cohort, are often attributed to the influences of the elements of the times that they have grown up in. Academics and educators also echo these concerns raised by the professional world. In order to understand the behaviors exhibited by the Millennials, it is important to understand the factors that contribute to that behavior.

Who are the Millennials? They are the youngest generational cohort and children of the Boomers. The Millennials are those who were born in or after 1982 (Monaco & Martin, 2007; Strauss & Howe, 2010; Wilson & Gerber, 2008). The three most recent generations prior to the Millennial Generation are the Gen Xers, born between 1961 and 1981, the Boomers, born between 1943 and 1960, and the Silent Generation, born between 1925 and 1942 (Strauss and Howe, 2007). But before we discuss the Millennials and their characteristics it is important to define what is meant by a generational cohort.

A generational cohort is a group of individuals similar in age who have experienced the same historical events within the same time period (Ryder as cited in Kowske et al., 2010). Generation membership is based on the shared position of an age-group in historical time (Mannheim as cited in Kowske et al., 2010). Generation

members are born, start school, enter the workforce, have children, and retire at about the same time and age. Further, generation members are the same age when wars are waged, technological advances are made, and other social changes occur. The concept of generation is important because the ebb and flow of new and old generations coupled with historical and social events drive social change, a process (Ryder as cited in Kowske et al., 2010) described as "demographic metabolism." When a new generation is born, social forces or agents of socialization, such as laws, mores, schools, and families, acquaint the newcomers with the society to which they now belong. Simultaneously, the newcomers form their own unique reactions to those socializing agents and the shared historical phenomena that occur at key developmental stages, especially young adulthood (Bakes et al. as cited in Kowske et al., 2010). Empirical research supports this fact; people at various developmental stages interpret historical events differently, with young adulthood being a particularly impressionable developmental stage (Duncan & Agronick and Noble & Schewe as cited in Kowske et al., 2010). Shared experiences at key developmental points contribute to the unique characteristics (e.g., values, attitudes, personality) that define and differentiate one generation from another (Kowske et al., 2010).

William Strauss and Neil Howe, two demographers, are credited with having studied generational biographies and classifying generational members into distinct cohorts.

Subsequent to their initial research findings in 1991, several studies have explored the

idea of generational membership. Recently, the Millennials (also known as Gen Y, Gen Next, and Net Gen) have been the subject of interest of both academic scholars as well as industry professionals. This interest can be attributed to the fact that they are the youngest, the largest, and the most recent generational cohort. According to Hershatter and Epstein (2010) and others, there are about 80 million Millennials in the USA. The Millennials are entering college and the workplace in large numbers. According to a report from the National Center for Educational Statistics, “the total undergraduate enrollment in degree-granting postsecondary institutions was 17.7 million in fall 2012, an increase of 48 percent from 1990 when total undergraduate enrollment was 12.0 million students. By 2023, undergraduate enrollment is projected to increase to 20.2 million”.

It is not surprising then that a sizable number of Millennials have been and will be entering the workforce. According to Tyler (2007), an HR professional, “Millennials generally account for the majority in a group of new hires”. Professionals in academia and industry alike are eager to understand this new demographic segment so that they can establish an effective and successful working relationship with them. Some hail the Millennials as the ‘Greatest Generation’ and some think of them as ‘Generation Whine’, the ‘Worst Generation’, the Narcissistic Generation’, or ‘Gen Me’ (Hershatter & Epstein, 2010; Safer, 2008; Wilson & Gerber, 2008). These divergent opinions/reactions, as Kowske et al., (2010) point out, can be attributed to the times in which they were born in. The Millennials were born at the same time as the Macs, the PCs and the Internet.

Unlike the previous generations, this generation has witnessed rapid advances in science and technology (Moore, 2007). They are adept at using a wide variety of gadgets and software applications and they use them frequently. The Millennials “instantly have information at their disposal through the internet, text messaging, instant messaging, PDAs and other forms of telecommunication. They have total access to information and each other twenty-four hours a day, seven days a week” (Monaco & Martin, 2007). “Technology is integral to their academic, social and personal lives; technology for them is a sixth sense, a way of knowing and interacting with the world” (Hershatter & Epstein, 2010). According to Strauss and Howe (2010), “the Millennials are the first generation to grow up with mobile digital technology. They expect nonstop interaction with their peers in forms that would have been unimaginable to prior generations of young adults. They will develop new standards for social networking”. Hershatter & Epstein (2010) call cell phones and online social networks as the two icons of the millennial lifestyle.

In addition to being driven by a technology-driven lifestyle, the millennial generation have also been exposed to certain unique socio-economic events. They have grown up in times of globalization, increasing demographic diversity, the second Iraq war, 9/11, and the economic and financial crisis (Moore, 2007; Ng et al., 2010; Wilson & Gerber, 2008).

These socio-economic events and technology, demographers say, have largely made the Millennials who they are. Some of the positive attributes ascribed to the Millennials are

that “they display ambition, confidence, optimism, and a capacity for high level cooperative work” (Strauss & Howe as cited in Wilson & Gerber, 2008). The Millennials are also believed to have a high sense of social responsibility but they often need to be told how to achieve these goals (Hershatter & Epstein, 2010). But studies also reveal that there are certain not-so-positive traits associated with this generation such as lack of professional boundaries and work ethic, the need for constant feedback and reassurance from authority figures, a sense of entitlement, lack of critical or independent thinking skills, and unrealistic expectations (Monaco & Martin, 2007; Moore, 2007; Wilson & Gerber, 2008). Many research studies have been conducted to understand the causes of these unflattering traits. Let us first look at what people from within the world of academia have to say.

Voices from Academia

Millennials have lived a sheltered life: “The millennial generation was raised in an environment where their parents advocated for them every step of the way” (Moore, 2007). According to Hershatter & Epstein (2010), “starting in their earliest years, US Millennials were revered, sheltered, and protected by a nation with Boomers at the helm, who seemed suddenly aware that home and school had failed Generation X...Even before they were born, their proud expectant helicopter parents were warned by their peers and the media to start planning for their futures, starting with preschool”. It is no surprise then that this generation is characterized by an unusual dependence on parents and family for guidance and advice. Parents are part of decisions that range from

academic scheduling to what extra-curricular activities their millennial offspring should participate in. According to Monaco and Martin (2007), “Parent-driven scheduled lifestyles with little ‘free time’ characterizes the life of Millennials (Monaco & Martin, 2007). “The millennial generation is one of the most scheduled –and perhaps overcommitted—of any generation. This generation fills their discretionary time with numerous activities” (Moore, 2007). In order to manage this hectic schedule, the Millennials are encouraged to follow rules and schedules. As a result of this lifestyle, The Millennials have come to expect rules and guidelines to be clearly communicated and enforced with diligence (Moore, 2007).

Governmental interventions in the form of policies and regulations also did their bit in engendering in the Millennials a craving for structure and clarity. In the early 1980s, about the time the first Millennials arrived, “the Federal government played the role of an overprotective Uncle Sam, activating federal agencies to assure that cars, products, homes, schools, and airwaves were safe zones for them” (Howard & Strauss as cited in Hershatter & Epstein, 2010). “As a consequence, Millennials have an inherent trust in organizations and a strong preference for structures and systems that support them. Longitudinal data gathered from more than 800 students attending four universities confirm these findings. Sixty percent of Millennials enrolled as business students agreed with the statement, ‘I trust authority figures to act in my best interest, while only forty percent of Gen Xers agreed with this statement when they were in business school’” (Hershatter & Epstein, 2010).

Having grown up in the times of 9/11, the second Iraq war, and the economic and financial crises, the millennial generation “has been most protected from harm than any generation in American history. A dense structure of new regulations now guards children and adolescents” say Wilson and Gerber (2008).

“The Millennials have been buckled, watched, fussed over, and fenced-in by wall-to-wall rules and chaperones” (Strauss & Howe as cited in Wilson & Gerber, 2008). “The Millennials have always felt loved and wanted by their doting parents. They have grown accustomed to supporting, nurturing environments that provide them with every opportunity to succeed” (Hershatter & Epstein, 2010).

Millennials have a sense of entitlement, are ambitious, feel pressured to perform: The Millennials have grown up hearing that “they are all winners” by just participating in various curricular and extra-curricular activities (Monaco & Martin, 2007). “They have not only been rewarded for winning but for the mere effort of trying” (Moore 2007). For this reason, the Millennials are often referred to as “trophy kids who spent their childhood receiving gold stars and shiny medals just for showing up...They’ve been indoctrinated from their earliest moment to seek approval and affirmation” (Hershatter & Epstein, 2010). Because Millennials have grown up not receiving candid feedback they lack a sense of self-awareness. “Too often they overestimate the value of their efforts and clamor for grades that should go only to the very best” (Wilson & Gerber, 2008). The emphasis on credentials and high grades “eclipses scrutiny of actual academic

content” (Hershatter & Epstein, 2010). “Millennials, have a high regard for themselves, not just as individuals but also as group. Wherever they are – college, high school, sports team, theater group, student government, and clubs – they are more inclined to think of anything done by their youth peers as competent, effective, and promising...This inward, present-oriented, ‘tribal’ focus’ that Millennials harbor about themselves and their peers can diminish regard for received canons of behavior and weaken restraints in a variety of ethical domains” (Strauss & Howe as cited in Wilson & Gerber, 2008). In an increasingly competitive world, the temptation to cheat will be ever stronger for teens and younger adults who are now resigned to cheating among their peers” (Twenge as cited in Wilson & Gerber, 2008).

The ever growing competition at every stage and in every sphere of life is another reason that contributes to the Millennials’ entitlement and achievement mindset. “Raised by workaholic parents in an economy designed for highly skilled labor, Millennials have internalized the message that they must build strong resumes and fast” (Wilson & Gerber, 2008). According to Hershatter and Epstein (2010), “many college bound Millennials are anxious to attend the most prestigious school to which they are admitted because they see a strong correlation between the status of the school from which they graduate and the best job opportunities”.

The pressure to do well and the competitive environment have instilled in the Millennials a fear of failure. “Kids are fearful of grades and fearful of failing because the

stakes seem higher than before. Millennial students want to know how their grades stand throughout the semester and are accustomed to this sort of frequent feedback in most of their other aspects of their lives” (Wilson & Gerber, 2008). They feel pressured to perform for those who will be their evaluators. According to Moore (2007), “Employers are asking to see grades and in some cases attendance records, homework levels are ever on the rise, class periods are lengthening and private tutors are more in demand than ever before because they are taught that what they accomplish now will pay later either in college or in employment”. The fear of failing and the pressure for having to perform and at high standards all the time makes them yearn for constant reassurance that that they are doing the right thing; doing what is expected. They look up to authority figures for inspiration and guidance. “They thrive on constant feedback and become paralyzed, often unable to proceed forward, without feedback and direction (Monaco & Martin, 2007). This constant handholding at home and in school hinders independent thinking and decision making skills.

The achievement and entitlement mindset also causes the Millennials “to have big dreams and expectations with an unclear path of how to reach the level of success they are so confident they will attain. The easy success with little effort that they are accustomed to leads to a modest commitment to homework. They become easily frustrated when they do not receive an A or B” say Monaco and Martin, 2007.

Millennials are ambitious but are not sure how to go about fulfilling their goals.

Tech- savvy and connected: The Millennials have grown up in a world driven by technology. The Internet and various forms of electronic gadgets play a ubiquitous role in their personal, social, academic, and professional lives. This technology-dependent existence has led to the Millennials becoming easily distractible, expecting quick responses, and being unable to demarcate personal and professional boundaries. According to Moore (2007), the Millennials “are a very connected generation. “Millennials use technology to stay in constant touch with friends and family”. “Before morning classes, Millennials can be seen on cell phones, keeping in close touch with friends on campus or back home. At the end of the school day, Millennials use the Internet to stay in constant contact with a larger circle of friends and family (Strauss & Howe as cited in Moore, 2007). “70% of Millennials use instant messaging to keep in touch with friends, 41% use email to connect with teachers and classmates and 81 % use email to stay in touch with friends and family” (Oblinger as cited in Moore, 2007). Being connected is rated as one of the most important priorities of this generation (Howe & Strauss as cited in Moore).

This 24/7 connectivity to people and to information has led to the Millennials wanting instant access and immediacy in responses at all times (Monaco & Martin, 2007). “They expect immediacy in all that they do, they want accurate information on their accounts, class schedules, and grades in real time, much like what they receive from Amazon.com or other online stores (Oblinger as cited in Moore, 2007). “More importantly, if they cannot get what they want from one retailer, they can easily go online and get it from

someone else. Besides everyday types of purchases, it also applies to higher education” says Moore, 2007. “Millennials will buy ‘what, where and how they learn’ so as to meet schedule and/or degree requirements” (Carlsen as cited in Moore, 2007). Wilson and Weber (2008) are of the same opinion. According to them, “Millennials expect a much greater array of products and selectivity. They have grown up with a huge array of choices and they believe that such abundance is their birthright” (Sweeny as cited in Wilson & Gerber, 2008).

Being online constantly and having instantaneous access to a variety of information at the tap of a finger has led to the Millennials becoming easily distractible. Distractability, according to Wilson and Gerber (2008), is a distinct characteristic of the Millennials and it can be attributed to the media-saturated world of the Millennials”. They are used to “multiprocessing and doing several things simultaneously – listening to music, talking on the mobile phone, using the computer, doing homework, eating, and watching TV” (Jonas-Dwyer and Pospisil, 2004).

Access to technology and vast amounts of information does not necessarily mean having an in-depth grasp of a subject matter. According to Moore (2007), “students may have immediate access to vast amounts of information, but often do not have the tools to use technology to extract the depth of information needed to develop critical thinking”. Hershatter and Epstein (2010) echo similar sentiments. According to them, “Millennials assume that all necessary information can be gathered with the touch of a

button on a 24/7/365 basis. If Millennials are asked to investigate a topic, they will turn first to Google and then to Wikipedia. If they need raw market data, they are able to instantly access extended social networks and obtain immediate feedback. Millennials believe that virtually every scholarly or academic article ever written will be available to them instantly and without cost, and they have little tolerance for claims of ownership or demands for rent. They seem to be blissfully unaware that most online sources rarely adhere to any standards of accuracy and validity". This tech- savvy generation, Moore (2007), opines, "has never experienced life without the Internet, therefore they don't always know how to evaluate the credibility of resources". Moreover, "it doesn't occur to them that there might be other non- Internet resources and that they should be considered as well. When a quick answer is readily available, Millennials tend to lack the motivation to seek a more nuanced one and by failing to diligently follow a path of inquiry, they miss perspectives that would enable them to evaluate the analysis of others" (Hershatter & Epstein, 2010).

Another characteristic that perplexes the older generations about the Millennials is their fascination with technology - the desire to publicly express their opinions. Referring to the December 2008 Pew Internet and American Life survey, Hershatter & Epstein, (2010) point out that nearly 20% of 18-32 year olds are likely to create blogs. According to Twenge (as cited in Hershatter & Epstein, 2010), "blogging is just one example among the many pieces of evidence that Millennials are showing preferences for using technology to capture, organize, and broadcast their thoughts, opinions and

experiences". Twenge, a psychologist, believes that the nature of technology and online social networking media is such that it causes the users, a significant portion of whom are Millennials, to become self-absorbed, oblivious to the consequences of their online actions. Because they grew up in the Internet age, they value confidentiality and privacy less than other age groups. In their thinking, information flow is virtually instantaneous and knowledge is meant to be shared rather than owned".

Voices from the Workplace

The feedback from workplace professionals about Millennials is not very different from those from academia. Morley Safer (2008) from CBS interviewed several professionals from diverse fields to get their perspective on the Millennials, the new generation of American workers. Marian Salzman was one of them. Salzman, an advertising agency executive at J. Walter Thompson, who has been managing and tracking Millennials since they entered the workforce has mixed feelings about the Millennials. She believes that "some of them are hardworking; they have these tools to get things done; they are enormously clever and resourceful. But some others are absolutely incorrigible. It's their way or the highway" (as cited in Safer, 2008). She attributes this rigid behavior to the Millennials' upbringing and the sheltered life that they have led. "They were raised by doting parents who told them they are special, played in little leagues with no winners or losers, or all winners. They are laden with trophies just for participating and they think your business-as-usual ethic is for the birds". (Salzman as cited in Safer, 2008). Jeffrey Zaslow, a Wall Street Journal columnist who covers trends in the workplace, says

that “the coddling virus continues to eat away even when junior goes off to college. I heard from several professors who said, a student will come up after class and say, 'I don't like my grade, and my mom wants to talk to you, here's the phone'. The students thinks it's like a service; I deserve an A because I'm paying for it. What are you giving me a C for?” Mary Crane, a millennial coach and a former White House employee, agrees with Salzman and Zaslow. According to her, “while this generation has extraordinary technical skills, childhoods filled with trophies and adulation, it didn't prepare them for the cold realities of work. They’ve never punched a time clock. They have no idea what it's like to actually be in an office at nine o'clock, with people handing them work and oh, by the way, possibly asking them to stay late in the evening, or their weekends. You now have a generation coming into the workplace that has grown up with the expectation that they will automatically win, and they'll always be rewarded, even for just showing up,” (as cited in Safer, 2008). Safer (2008) says that today’s workplaces are “faced with new employees who want to roll into work with their iPods and flip flops around noon, but still expect to be CEO by Friday”.

A study conducted by Ng et al., (2010) confirm Safer’s (2008) assessment of the unrealistic expectations of the Millennials. “The Millennials ‘want it all’ and they ‘want it now’ in terms of good pay and benefits, rapid advancements, work/life balance, interesting and challenging work, and making a contribution to society”. According to data collected from the 2004 Corporate Leadership Council, “pay was found to be the single most important motivational factor for the Millennials” (Ng et al., 2010). Ng et al.,

(2010) believe that “the emphasis on financial reward may reflect, in part, the Millennials’ need for feedback. Alternatively, the expectation of good pay and benefits may also reflect the sense of entitlement that persists among Millennials”. Hill (as cited in Ng et al., 2010) used the term ‘ability-performance nexus’ to describe the disconnect between what Millennials expect to achieve and what they are capable of achieving”.

Ng et al., (2010) further point out that “Millennials also appear to have high expectations when it comes to promotions and pay raises”. Referencing Pooley’s 2005 and 2006 study findings, Ng et al., (2010) cite the example of a recent university graduate working at an investment bank in downtown Toronto “who reported that he will learn as much as he can and then move on for something bigger and better, because he couldn’t wait two years to get promoted. This ‘impatient to succeed attitude’ Ng et al., (2010) say “has resulted in an expectation for instant rewards rather than ‘paying dues’, which the Gen Xers have had to endure”. When they do not see the quick reward at one firm, Millennials will move to an employer that provides greater opportunities. It is interesting to note that while promotions are important to Millennials, they want them with minimal effort, perhaps reflecting the sense of entitlement that is the product of a pampered upbringing (Corporate Leadership Council, 2005 & Twenge, 2006 as cited in Ng et al., 2010).

Salzman, the ad professional, agrees with Ng et al., (2010) that commitment to a company is a quality that is hard to find in the Millennials. She says, “You can't really

ask them to live and breathe the company. Because they're living and breathing themselves and that keeps them very busy" (as cited in Safer, 2008). Technology and the options it provides via social and professional networking sites is largely blamed (in addition to the cloistered upbringing) for these self-centered tendencies of the Millennials. According to Safer (2008), "they are tech savvy, with every gadget imaginable almost becoming an extension of their bodies. They multitask, talk, walk, listen and type, and text. And their priorities are simple: they come first". Salzman says, "I believe that they actually think of themselves like merchandise on eBay. If you don't want me, Mr. Employer, I'll go sell myself down the street. I'll probably get more money. I'll definitely get a better experience. And by the way, they'll adore me. You only like me," (as cited in Safer, 2008).

Dorsey, a Millennial professional, sees nothing wrong with having options or job hopping. While admitting to Safer (2008) that his mother helped pick out his suit for the interview, Dorsey says, "We have options. That we can keep hopping jobs. No longer is it bad to have four jobs on your resume in a year. Whereas for our parents or even Gen X, that was terrible. But that's the new reality for us. And we're going to keep adapting and switching and trying new things until we figure out what it is. We definitely put lifestyle and friends above work. No question about it". Healy, another millennial professional that Safer (2008) interviewed, feels the same way. According to him, "that's pretty much the way one should look at life. I also think from when you're in your early 20s and you're really not responsible to a family of kids, this is the time to find the best

job, the best career. You know, what you really want to do". Ng et al., (2010) study confirms Dorsey and Healy's feedback. According to them, "Millennials seek employers who can provide them with fluidity between work and play. Millennials are currently in their 20s, and often are free from family or care-taking commitments at this stage of their life cycle".

Zaslow, the Wall Street Journal columnist and Crane, the millennial coach and consultant, feel that there is another reason for this lack of commitment to an organization. Zaslow says, "Today more than half of college seniors move home after graduation. It's a safety net, or safety diaper, that allows many kids to quickly opt out of a job they don't like" (as cited in Safer, 2008). Crane believes that there is no shame in moving back home and living with your parents when you are in your 20s. In fact it "is thought to be a very smart, wise, economic decision and suggests that they probably had happy childhoods, growing up in a world where there's no failure" (as cited in Safer, 2008).

Being self-centered is not the only problem that arises from the Millennials' addiction to technology. Kathryn Tyler (2007), an HR consultant, says that the Millennials' penchant for multitasking with various technological devices makes them oblivious to workplace protocol. According to her, "you need to explain things in an explicit manner why something is acceptable or not. When and where, for example, is it appropriate to make and receive cell phone calls? Are there times when it is permissible to wear an iPod

while working? Is it OK to surf the Internet while talking on the phone? How much time should be allowed for a response after sending a colleague an e-mail or an instant message?" Tyler says that there have been issues with the Millennials expecting an instant reply to a message.

Because to the Millennials the world is without boundaries, thanks to technology (Hershatler & Epstein, 2010), they don't completely understand issues surrounding privacy and confidentiality. Tyler (2007) points out that "members of previous generations understood unspoken taboos against discussing salaries and performance appraisal scores in public, but Millennials blog their innermost secrets on MySpace and post videos of themselves doing anything on YouTube". "Millennials tend to blur the public and private" (Twenge as cited in Tyler, 2007). "As a result, they may not realize others' needs for privacy. Companies with a lot of proprietary information need to be especially cautious and clear about boundaries and about the consequences for failing to adhere to them" (Tyler, 2007). Millennials may have "a more casual attitude in using the Internet for sending confidential information with little awareness of legal ramifications or sensitive issues," says Linda Harber, Associate Vice President for Human Resources and Payroll at George Mason University (as cited in Tyler, 2007).

"Unlike new hires of previous generations, who may have benefited from training in diversity or technical matters, experts say, Millennials need other types of training-in professional behavior, for example, or in basic writing, confidentiality issues, critical

thinking, or how to give and receive constructive criticism” Tyler (2007). This sentiment/feedback about the Millennials is consistently voiced both in the world of academia as well as the in world of work.

Hershatter and Epstein (2010), point out that “the complexity of organizations and the environments in which they operate demands a more nuanced, informed framework for analysis and understanding. If Millennials are going to become valued knowledge workers, they must learn not only what information to gather, but also how to verify and understand it in context. In order to analyze, synthesize, and represent that information in a way that is relevant to the problem at hand, they will need to know more than how to scan; they need to learn to read deeply and between the lines”.

Murray (2013), a former senior executive and now a consultant, believes that “unless Millennials had access to technology and could Google the question, they could not use a manual problem-solving process”.

Managers and workplace professionals find the lack of independent thinking skills on the part of the Millennials and their need for constant structure and clarity a little draining. According to Hershatter and Epstein (2010), “Millennial preferences for clarity and certainty do not evaporate at graduation. The Global MBA Survey of more than 5600 students enrolled in MBA programs confirms that Millennials prefer to work in organizations with centralized decision making, clearly defined responsibilities and

formalized procedures. Nearly 72% agreed with the statement, 'I prefer a structured environment with clear rules as compared with just 33% of Gen Xers'. For this reason, "Some managers might argue that 'demanding workforce' is far too kind a phrase for the Millennials. Managers of Millennials frequently describe their employees as 'high maintenance' or 'needy'. Managers of all generations may find the millennial need for structure and reassurance draining" (Hershatler & Epstein, 2010). Salzman is of the same opinion, "You do have to speak to them a little bit like a therapist on television might speak to a patient. You can't be harsh. You cannot tell them you're disappointed in them" (as cited in Safer, 2008). Crane believes that managers will be better off if they are explicit in their instructions to the millennials. "The boomers do need to hear the message that they're going to have to start focusing more on coaching rather than bossing. This generation in particular, you just tell them, you got to do this, you got to do this, you got to do this" (as cited in Safer, 2008).

Becki Lindley, a pre-venture capital firm principal at Cobalt Investments does just that.

Below is an example of how she frames assignments for her millennial interns:

There is no clear answer here – no correct answer. The purpose of this project is for you to identify and analyze options. Then you will make recommendations based on your research. First, conduct research using x, y, and z. Next, organize that research into compelling arguments for and against this project. Then, present this information to me in an executive summary that you will present to me verbally.

In her experience, when she clearly framed the assignment outcomes and acknowledged the ambiguous nature of the project, her interns provided her with outstanding analysis and recommendations (as cited in Hershatter & Epstein, 2010).

The Ethics Resource Center (ERC), a nonprofit organization that researches ethical standards and practices in private and public organizations conducted a survey of generational differences in workplace ethics in 2009 and 2011. Their findings about the millennial cohort is not very different from the feedback of industry professionals especially as it pertains to data privacy and misuse of technology.

Key Points from the 2009 Survey

- All younger workers, but Millennials especially, are a significant area of vulnerability in terms of observed misconduct
- They are more likely to find it acceptable to keep copies of confidential documents and are less likely to take note of breaches of privacy
- Younger workers are more likely to observe misconduct, less likely to report it
- They have fewer resources to draw from, given that they have the least life and work experience
- Because they grew up in the Internet age, they value confidentiality and privacy less than other age groups. In their thinking, information flow is virtually instantaneous and knowledge is meant to be shared rather than owned

- Millennial workers are the least likely to find it acceptable to give a cold shoulder to someone for reporting an edgy joke

Key Points from the 2011 Survey

- Millennials lack basic literacy fundamentals, very short attention spans, not loyal to employing organization, demand immediate feedback and recognition, likely to change jobs quickly
- Millennials appear to observe fewer boundaries than previous generations and are more flexible about when and how to apply them. In being more open and transparent, they become more likely to discuss work activity with a wider range of people both in public and in private. Their flexibility might make Millennials more likely to engage in or tolerate behavior that many consider unacceptable
- Millennials were more likely than their older cohorts to utilize the resources of ethics and compliance offices
- In 2011, 15 percent of Millennials reported pressure to compromise standards, company policies, or the law; the youngest workers historically have observed misconduct compared to their older colleagues. That pattern held true in 2011. Almost half of Millennials (49 percent) said they observed workplace misconduct or rules violations in 2011
- They have a tendency to integrate work and personal life, making them less likely than other cohorts to draw boundaries between the two

- At every age, employees usually report to those they know well and can trust: their supervisors. In 2011, more than half of employees in every age group said they went to their supervisor first. Among the youngest workers, 58 percent of Millennials reported to their immediate boss. The second choice for an initial report was “higher management”
- It is also noteworthy that, in comparison to other cohorts, the youngest were most likely to report to a hotline. Eight percent of Millennials chose the hotline option for their initial report of misconduct

Summary and Conclusion

Millennials

- need explicit instructions and feedback
- have the least life and work experience of all the generational cohorts
- look up to authority figures for guidance and inspiration
- expect quick responses/solutions
- have little understanding of confidentiality and privacy issues and personal-professional boundaries as it pertains to online activities owing to their technology-dependent lives
- have a high sense of social responsibility and are keen to do the right thing but need to be told how

The situated learning model of instruction can be especially helpful in addressing the traits and learning needs of millennial students. Situated learning uses specific examples

situated in authentic contexts to orient/socialize students to the various ethical scenarios they will encounter in the workplace, it provides opportunities to students to learn from experienced members of the community of practice they will be entering, and situated learning points the novice professional to cultural/organizational resources that they can consult when caught in an ethical dilemma.

BLOOM'S TAXONOMY

Since I test students' understanding of the organizational codes at a basic level or Bloom's level 1 and level 2 of reasoning, I briefly review literature on Bloom's Taxonomy to help structure my pre-test and post-test

Benjamin Bloom and a team of "thirty three educators from different disciplines and universities interested in research in global educational goals and testing" (Reeves, 1990) developed, in 1956, what has come to be known as Bloom's Taxonomy of Educational Objectives. Bloom identified six increasing levels of cognitive learning that progressed from simple, recall level learning to more complex, abstract ways of thinking. The foundational levels include

1. **Knowledge:** refers to the ability to remember or recall specific facts, concepts, terminology, trends and sequences, definitions, principles and theories, classifications and categories, criteria, and methodology (Krathwohl, 2002). Question words intended at assessing this level would include define, describe, label, recite, select, name, state, and identify.
2. **Comprehension:** focuses on the meaning or intent of the material. Learners are able to solve problems similar to those studied in class; they show evidence of knowing what is communicated and are able to make some limited use of it (Reeves, 1990). Questions that test for understanding or comprehension would include words such as summarize, paraphrase, give examples, explain, and locate.

The higher levels of reasoning, which develops gradually with practice and experience include

3. Application: refers to being able to transfer learning to new situations. It refers to the ability of students to “restructure an unfamiliar problem from their fund of rote memory knowledge into a familiar context. However, their application may not be correct, but practice makes perfect” (Reeves, 1990). Examples of words that test for application include apply, modify, translate, and demonstrate.
4. Analysis: refers to being able to identify the relationship between different parts of a larger piece of information or content, being able to draw logical inferences and provide supporting evidence. Examples of assessment words include analyze, classify, distinguish, differentiate, examine, calculate, compare and contrast (Munzenmaier and Rubin, 2013)
5. Synthesis: refers to the creativity of the student to produce original work/solutions that fit a particular context; being able to make judgments based on criteria and standards. Assessment words might include plan, critique, design, and formulate (Felder & Brent, 2004; Munzenmaier & Rubin, 2013)
6. Evaluation: “involves making judgments about value. Learning objectives at this level require learners to measure, value, estimate, choose, or revise something, perhaps information, a product or solve a problem” (Munzenmaier & Rubin, 2013).

According to Bloom (1956), learners need to have a firm grasp of the basic facts before they are able to apply knowledge in mature, complex ways. In other words, each higher level of learning depends on the level below it (Forehand, 2102; Galloway, 2008).

It must be noted though, that one need not progress through all six levels of learning/reasoning to perform every single task. “Different tasks call for dramatically different knowledge and skill levels, with some tasks requiring only rote memorization to complete and others calling for sophisticated analytical skills and creativity” (Felder & Brent (2004). What the Blooms Taxonomy does is help instructors “make sure that they are teaching and testing at an appropriate level for their students” (Felder & Brent, 2004).

CHAPTER 3: RESEARCH QUESTIONS, RESEARCH DESIGN, AND METHODOLOGY

RESEARCH QUESTIONS AND CORRESPONDING HYPOTHESES

My research has a dual focus: 1) content of instruction (organizational codes of conduct) and 2) the method of instruction (the industry representative using cognitive apprenticeship, a situated learning method, to facilitate the content). These are addressed by the following two research questions

Research question 1: What is the students' level of understanding of the six areas of organizational codes of ethics (listed below) and of the terms associated with the codes (for example, official records, intellectual property) prior to the intervention and after the intervention?

1. Confidentiality and data privacy
2. Conflict of interest
3. Electronic communication and use of technology
4. Records management and information security
5. Organizational resources for employees to consult and stay informed
6. Reporting procedures for code violations

Hypothesis 1 a: Prior to the intervention, students will have a general understanding of the six areas of organizational codes used in this study.

Hypothesis 1 b: The study intervention will provide the students with a situated/organizational understanding of the six areas of organizational codes.

Hypothesis 1 c: The impact of the intervention will be significantly higher for the questions/scenarios that require the students to explain the rationale behind and the consequences of the six organizational codes.

Research question 2: What are the students' attitude (feedback) towards the situated nature of the content and the fact that it was facilitated by an experienced professional from the industry?

Hypothesis 2 a: Students will find that the situated nature of the content enables them to apply classroom learning of everyday ethics in a workplace context.

Hypothesis 2 b: Students will appreciate the organizational context provided by the experienced professional.

RESEARCH DESIGN AND METHODOLOGY

Since the first research question was analyzed using quantitative research methods and the second research question was analyzed using qualitative methods, my study is partly quasi-experimental and partly qualitative. As is typical of quasi-experimental studies, I used a pre-test – intervention – post-test design. Time and logistical constraints prevented me from complete randomization and the use of a control group. The quasi-experimental study design strategy was also chosen because it:

1. Aims to answer questions such as – “Does a treatment or an intervention have an impact?” and what is the relationship between program practices and outcomes?”
2. Allows for the quantification of data thereby mimicking a true experiment

3. It works well in natural settings and is accommodative of practical and real-world elements such as time and logistical constraints (Bradley, 2009; Harris et al., 2006; Dimsdale & Kutner, 2004).

Research question 1 was analyzed using quantitative research methods on two levels:

1. Aggregate level: to determine if there was, in the class as a whole, a statistically significant performance improvement from the pre to the post-test. A paired T-test was used to test the corresponding hypotheses 1a and 1b.
2. Question-by-question level: to determine if there was a statistically significant performance improvement in the class from the pre to the post-test for each question. Given the non-parametric nature of the data, a Wilcoxon Signed Rank Test was used to test hypothesis 1c.

Research question 2 was analyzed qualitatively; students written responses to a post-test reflection questionnaire formed the basis of analysis. The post-test reflection revealed students' attitude towards the content and the fact that it was facilitated by an experienced practitioner from their community of practice. The results were used to address hypothesis 2a and 2b.

IRB Application, Review and Approval: In order to begin conducting this study involving human subjects, approval needed to be obtained from the Institutional Review Board

(IRB). This approval ensured that both my advisor and I, passed the Human Subject Research course modules in the Social-Behavioral-Educational (SBE) track which is administered by the Collaborative Institutional Training Initiative (CITI) program. Additionally, the approval ensures that the proposed research would not jeopardize the safety of the human subjects and the data collected would be de-identified before use in the analysis. The IRB approval IRB# 14.250 was granted on February 7, 2014 for three years. Following IRB's stipulations for voluntary participation, the participants of this study signed a consent form allowing them to withdraw from the study at any time.

Study Institution and Participants: The study was conducted at a large, urban, public, mid-western university in spring 2014. The participants in this study were traditional-aged undergraduate students in the spring 2014 mechanical engineering senior capstone design class and a senior-level supply chain class. In other words, my study participants were business and engineering students who were poised to graduate and join the workforce. The rationale for choosing study participants from these particular majors are as follows:

1. The mechanical engineering department is the largest of all engineering departments in the chosen institution of study; hence out of all the capstone design classes across all departments, the mechanical engineering class had the largest number of participants. Additionally, like all other departments in the engineering school, the mechanical engineering department measures

the ABET accreditation learning outcomes that are related to ethics through the senior capstone design class.

2. The supply chain class in the institution of study was chosen because supply chain professionals interact with a large number of stakeholders, particularly external stakeholders such as suppliers and vendors where ethical scenarios as it pertains to fiduciary duties and conflict of interest can befuddle a young and new supply chain professional.

Pre-test: The study participants responded to a questionnaire that was designed to specifically test the students' initial understanding (before the intervention) of the six areas of organizational codes and their ability to apply the appropriate code/s to real-world scenarios situated in their respective professions. The pre-test was also designed to concurrently address the accreditation requirements in the case of the mechanical engineering group. The pre and post-test questions are included in the appendix.

Intervention: An experienced supply chain professional, who is also a lawyer at Harley-Davidson Motor Company used his company's organizational codes as a basis to explain to students the meaning and rationale behind the six codes identified above. He used everyday scenarios from within his organizational context as well as from the supply chain profession to explain how the codes can be used to help identify and resolve ethical situations and what might be some consequences of noncompliance. The professional made explicit to the students his thought process behind his assessment of

handling various ethical situations. This process of the expert practitioner verbalizing his/her thought process in a classroom setting and showing to students why s/he chose a particular method to address an issue situated in authentic contexts is referred to as cognitive apprenticeship, a situated learning approach. An experienced mechanical engineering professional, who is also a lawyer at GE Healthcare Company did likewise with the mechanical engineering students. Due to time constraints, both professionals spoke to the students for an hour each. The objective of the instructional session was not to orient students to a particular organization's codes but rather to use an organization's codes as a basis to help students develop a situated understanding of the codes and related concepts so that they can use this awareness/understanding in their future places of employment (by taking proactive measures to identify and deal with ethical situations). The questions and scenarios used in the pre and post-test were developed in consultation with the professionals as well as the instructors. This was done to ensure that the questions were situated in the organizational context as well as in the students' professional field.

Post-test: Students took the post-test, a replica of the pre-test, after the industry representative's session. The purpose of the post-test was to determine if, as a result of the intervention, (the instructional session by the industry professional), there was a significant improvement in the students' responses (i.e. if the students' post-test responses demonstrated a situated understanding of the questions/scenarios).

Post-test Reflection: After the post-test, students responded to a written reflective exercise. This portion of the study had two objectives: 1) to solicit students' feedback about the situated nature of the content and instruction 2) to provide an opportunity for students to think metacognitively about their learning experience.

A Note on the Study Procedure: The pre-test, intervention, and post-test for supply chain were all conducted in a single session as the instructor was able to spare only one class session for the study. For mechanical engineering, the pre-test was conducted in one session and the intervention and post-test were conducted two weeks later in a separate session as these were the time slots the instructor was able to allot for my study.

Evaluation of Student Responses: The responses to the questions were first discussed with the practitioner and these were then converted into a rubric (see appendix). This rubric was used by me and another grader (so as to eliminate bias and strengthen the analysis), to rate the student responses.

CHAPTER 4: DATA ANALYSIS RESULTS

STUDY PARTICIPANTS INFORMATION

The following is a summary of participants' demographics:

1. Number of student participants in supply chain: 24
2. Number of student participants in mechanical engineering: 20

Figures 2, 3, 4, 5, 6, and 7 shows information about students' prior work experience and prior ethics instruction.

Fig 2: Supply Chain Prior Work Experience and Prior Ethics Instruction Data

Attributes	Categories	No. of students
Prior work experience	Relevant work experience in supply chain (coops, internships, fulltime)	12
	Other work experience	8
	No work experience	4
Prior ethics instruction	Had ethics instruction (standalone or part of a course)	18
	No ethics instruction	5
	No response	1

Fig 3: Supply Chain Prior Work Experience Percentage Pie Chart

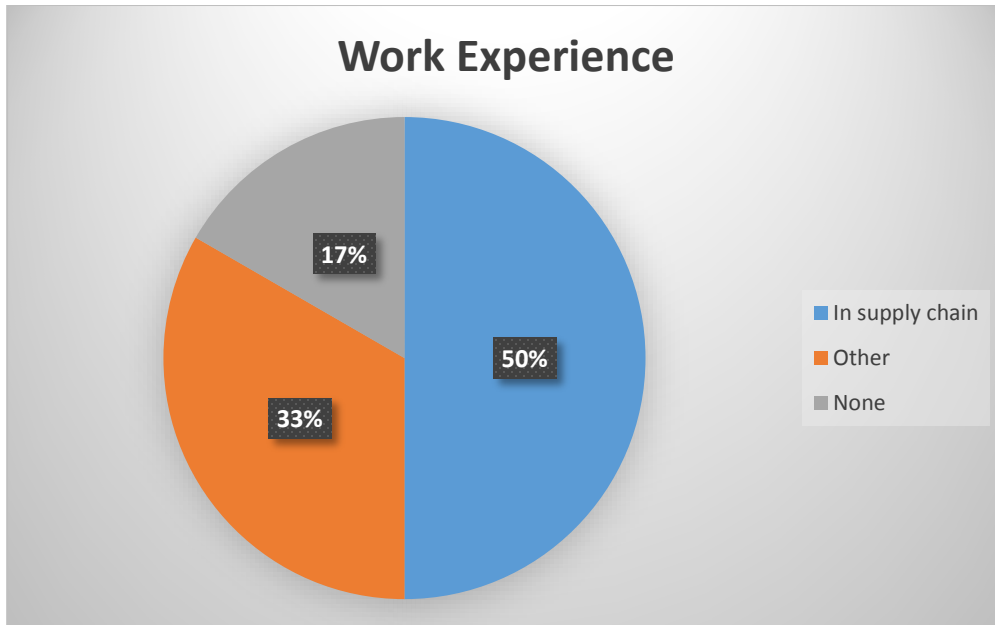


Fig 4: Supply Chain Prior Ethics Instruction Percentage Pie Chart

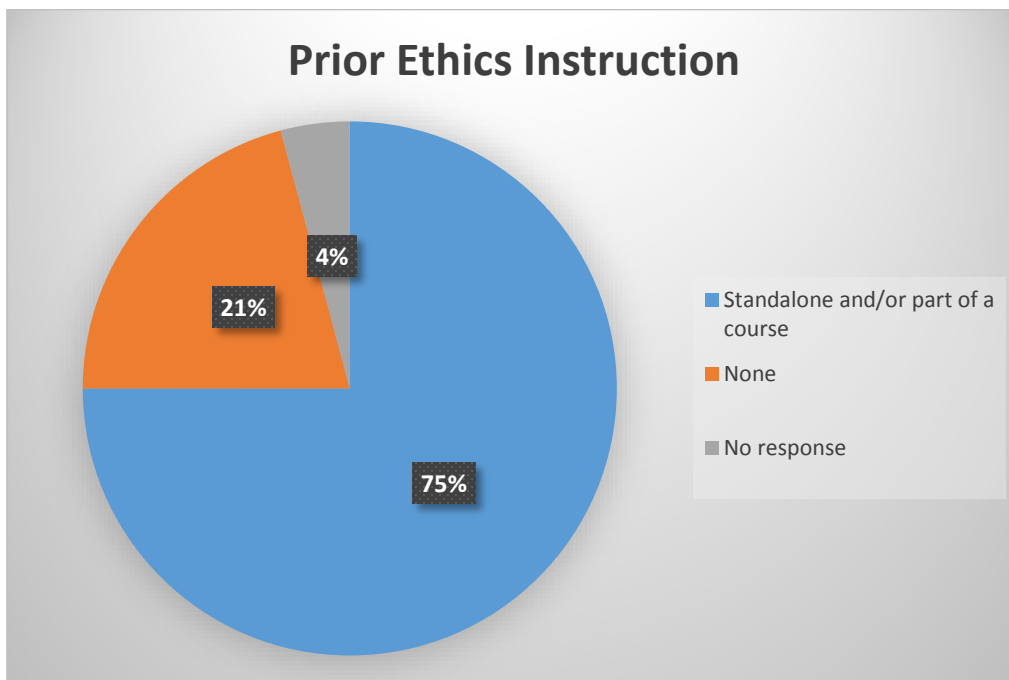


Fig 5: Mechanical Engineering Prior Work Experience and Prior Ethics Instruction Data

Attribute	Categories	No. of Students
Prior work experience	Work experience in engineering (co-ops/internships/full time)	18
	Other work experience	0
	No work experience (internship or fulltime)	2
Prior ethics instruction	Had ethics instruction	9
	No ethics instruction	11

Fig 6: Mechanical Engineering Prior Work Experience Percentage Pie Chart

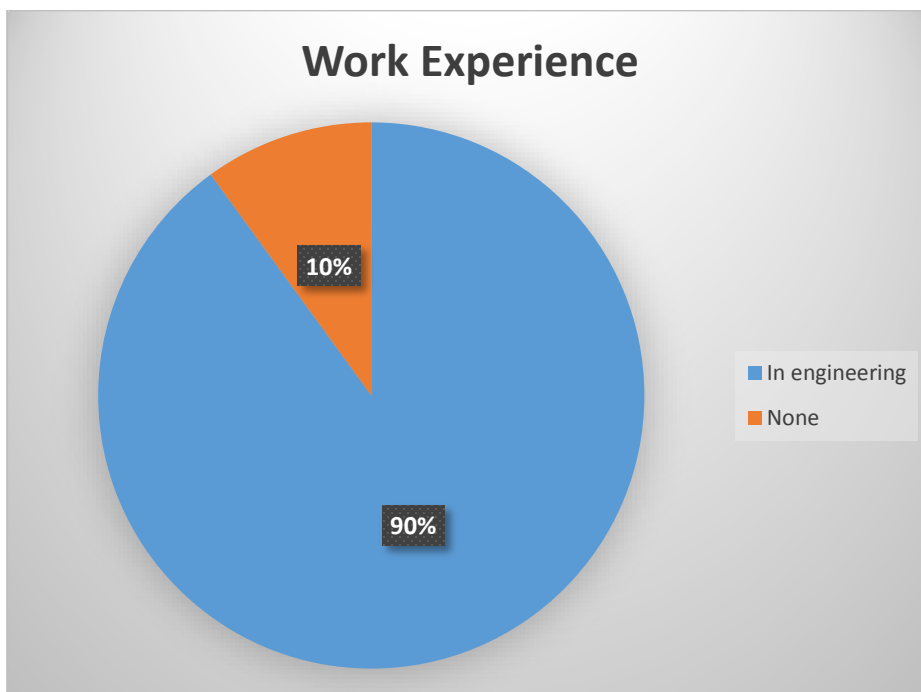
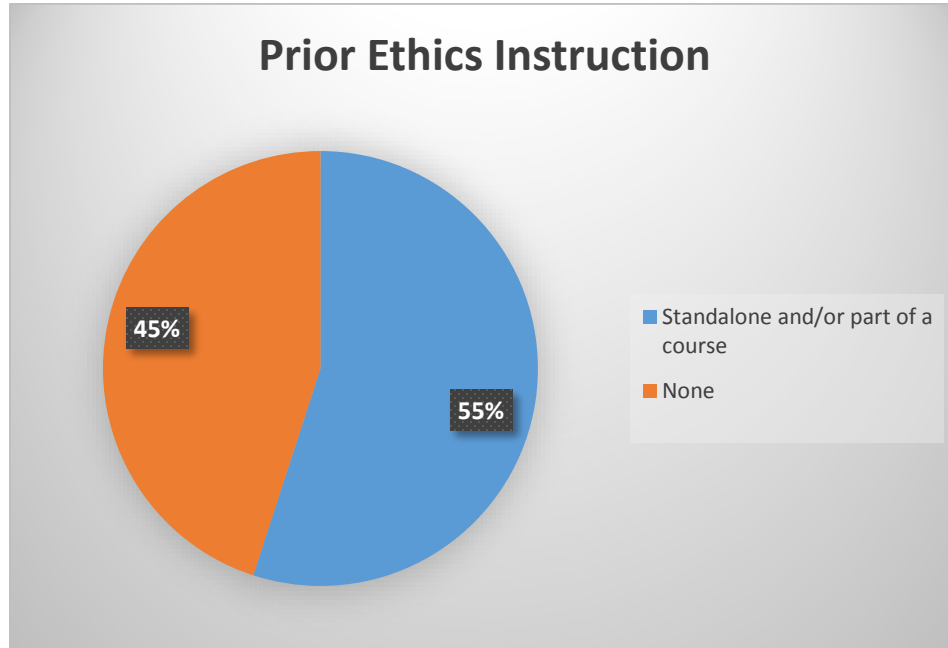


Fig 7: Mechanical Engineering Prior Ethics Instruction Percentage Pie Chart



QUANTITATIVE ANALYSIS RESULTS

This section pertains to the quantitative section of my study which is addressed by the first research question - What is the students' level of understanding of the six areas of organizational codes of ethics (listed below) and of the terms associated with the codes (for example, official records and intellectual property) prior to the intervention and after the intervention?

1. Confidentiality and data privacy
2. Conflict of interest
3. Electronic communication and use of technology
4. Records management and information security
5. Organizational resources for employees to consult and stay informed
6. Reporting procedures for code violations

In order to determine if the post-test supply chain and mechanical engineering scores demonstrated statistical significance over the pre-test scores, the quantitative analysis was done on two levels:

1. Aggregate level: to determine if there was, in the class as a whole, a statistically significant performance improvement from the pre to the post-test. A paired T-test was used to test hypotheses 1a and 1b.
2. Question-by-question level: to determine if there was a statistically significant performance improvement in the class from the pre to the post-test for each question. Given the non-parametric nature of the data, a Wilcoxon Signed Rank Test was used to test hypothesis 1c.

Paired T-test at an Aggregate Level

Each question on the pre and post-test was assigned points on a scale of 0 to 3 depending on the required number of responses. For instance, question 4 in the mechanical engineering pre/post-test, which asked study participants to “List three documents/records that might be considered confidential from a mechanical engineering perspective,” was assigned 3 points. The responses to the questions were first discussed with the practitioner and these were then converted into a rubric. Both the primary researcher and an independent rater graded each question based on the rubric (to eliminate bias and to strengthen the analysis). The rater’s grade and my grade for supply chain and mechanical engineering pre and post-tests tallied for all the responses. The response variables for the T-tests were the actual total score for the pre

and post-test for each student. The T-test was used to address the following hypotheses of my first research question:

Hypothesis 1 a: Prior to the intervention, students will have a general understanding of the six areas of organizational codes used in this study.

Hypothesis 1 b: The study intervention will provide the students with a situated/organizational understanding of the six areas of organizational codes.

The paired T-test, which uses the differences between the pre and post score for each student was used to determine if the post-test scores were statistically higher than the pre-test scores. Normally, a paired T-test is used when the variables (in this case pre and post-test scores) are dependent (linked to a homogenous set of students). “The paired T-test assumes that the differences between pairs are normally distributed” (McDonald, 2009). Therefore, before conducting the paired T-test, tests for normality were conducted on the supply chain and mechanical engineering pre and post-test data, as well as on the performance differences between the pre and post-test data separately. The tests, as presented in Figures 8, 9, 10, 11, 12, and 13 indicate that only the supply chain post-test data (Figure 9) was not normally distributed.

Fig 8: Pre-test Supply Chain Normality Test

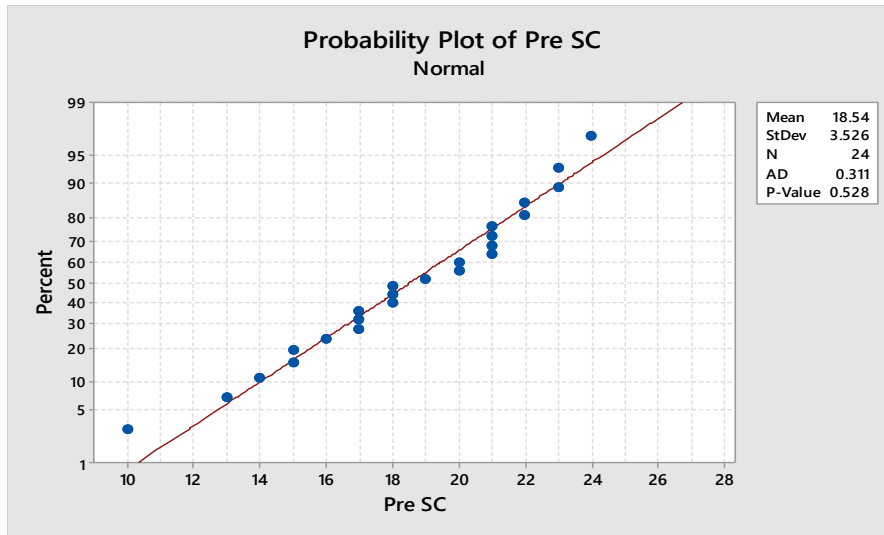


Fig 9: Post-test Supply Chain Normality Test

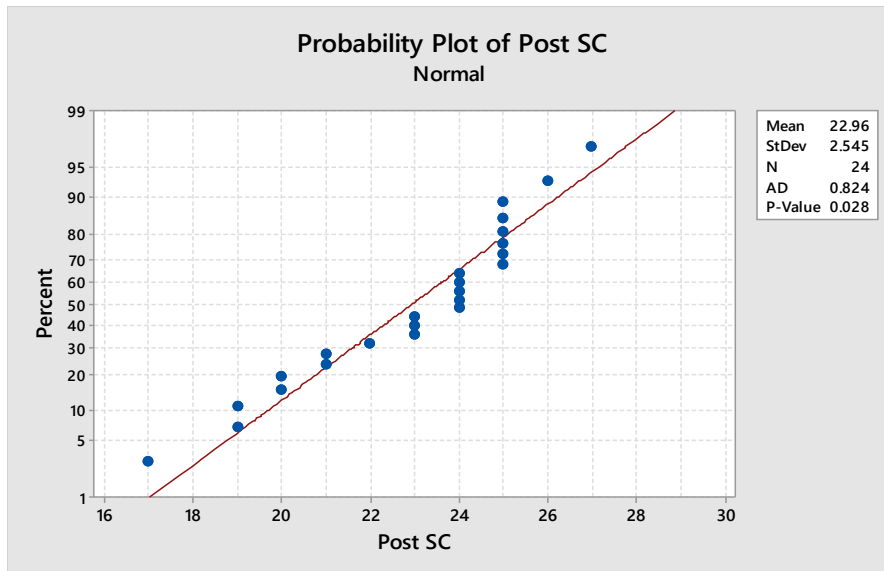


Fig 10: Performance Difference between Pre and Post-test of Individual Students

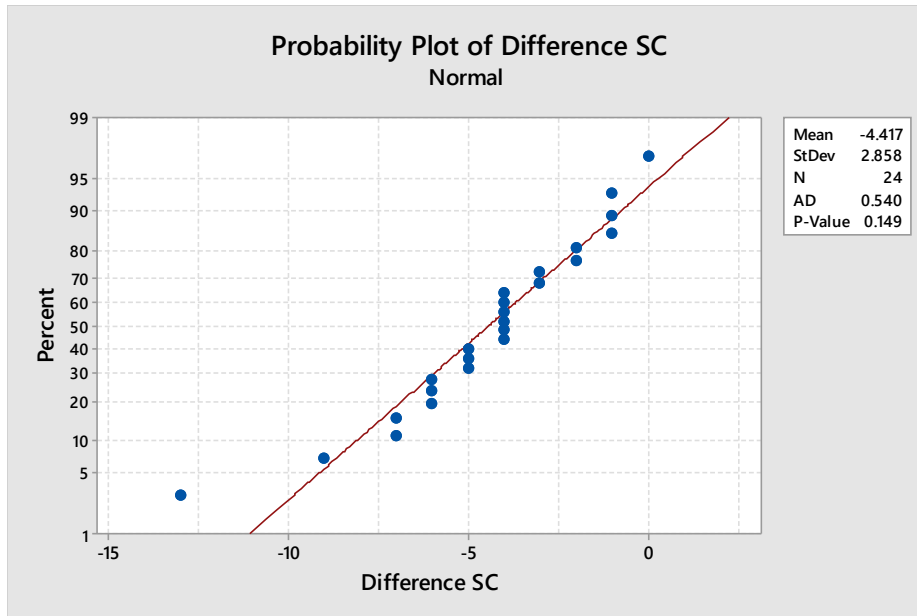


Fig 11: Pre-test Mechanical Engineering Normality Test

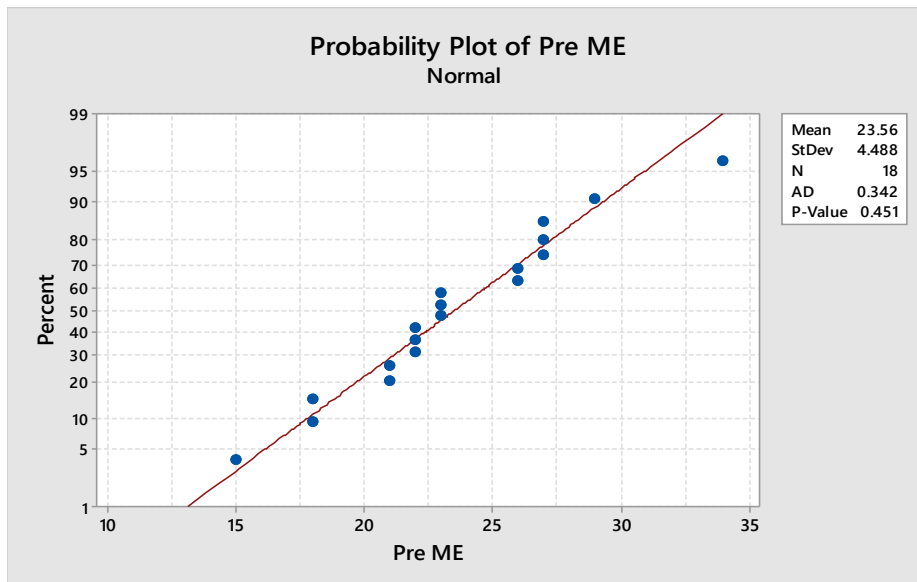


Fig 12: Post-test Mechanical Engineering Normality Test

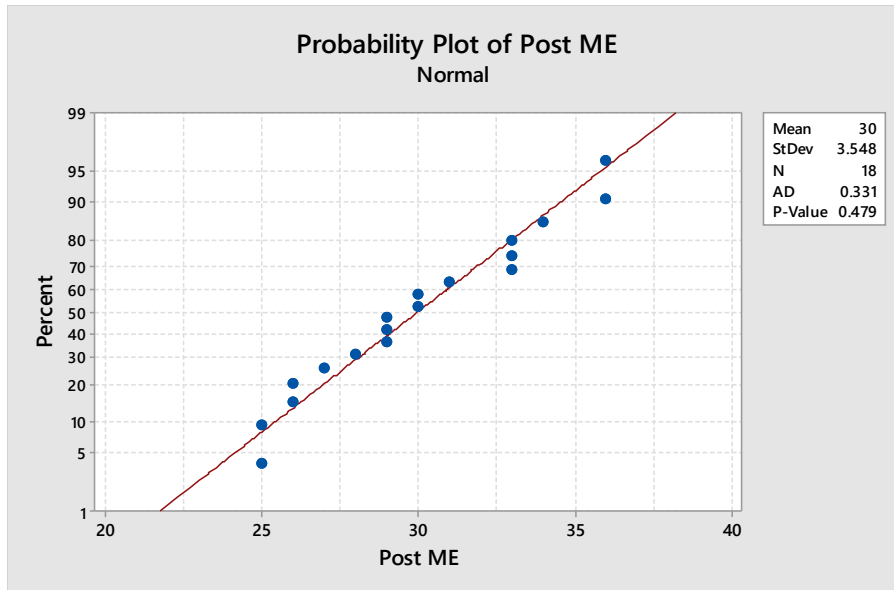
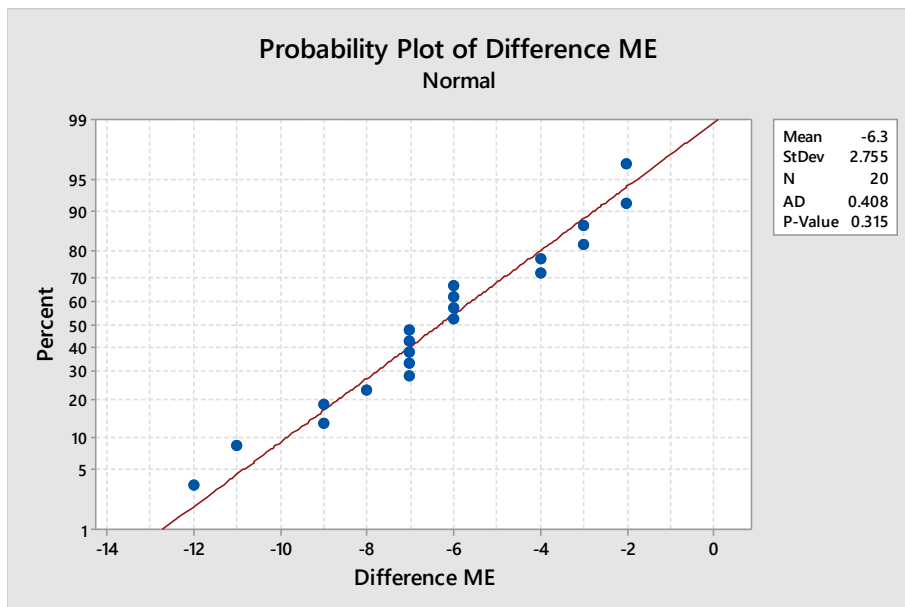


Fig 13: Performance Difference between Pre and Post-test of Individual Students



Following the normality tests, paired T-tests were performed on both data sets (the performance difference between the pre and post-test for supply chain and mechanical engineering) to determine whether there was a statistically significant mean difference in the student scores before and after the intervention by the industry professional.

The results of the paired T-test are reported in Figures 14 and 15. Since the p-values for both supply chain and mechanical engineering are below 0.05 following a 95% confidence limit, it can be inferred that the post-test scores for both classes were statistically higher than the pre-test scores. In addition, a comparison of the 95% confidence intervals for both groups indicates that the engineering class particularly showed a marked increase in the post-test scores.

Fig 14: Paired T-test–Supply Chain

Double Tailed Paired T-test and CI: Pre Supply Chain, Post Supply Chain				
Paired T for Pre SC - Post SC				
	N	Mean	Std.Dev.	SE Mean
Pre SC	24	18.542	3.526	0.720
Post SC	24	22.958	2.545	0.519
Difference	24	-4.417	2.858	0.583
95% CI for mean difference: (-5.623, -3.210)				
T-Test of mean difference = 0 (vs ≠ 0): T-Value = -7.57 P-Value = 0.000				

Fig 15: Paired T-test for Mechanical Engineering

Doubled Tailed Paired T-test and CI: Pre Mech Eng, Post Mech Eng				
Paired T for Pre ME - Post ME				
	N	Mean	Std.Dev.	SE Mean
Pre ME	20	23.600	4.297	0.961
Post ME	20	29.900	3.386	0.757
Difference	20	-6.300	2.755	0.616
95% CI for mean difference: (-7.589, -5.011)				
T-Test of mean difference = 0 (vs ≠ 0): T-Value = -10.23 P-Value = 0.000				

Wilcoxon Signed Rank Test at a Question By Question Level

In order to determine whether the performance of the supply chain and mechanical engineering classes in the post-test for each of the questions was statistically higher than the corresponding questions in the pre-test, a Wilcoxon Signed Rank Test was used. This portion of the analysis tests my third hypothesis (hypothesis 1c) of my first research question:

Hypothesis 1 c: The impact of the intervention will be significantly higher for the questions/scenarios that require the students to explain the rationale behind and the consequences of the six organizational codes.

Figures 16 and 17 show the questions that were asked of the supply chain and mechanical engineering students

Fig 16: Supply Chain Pre/Post-test Questions

1. This is your first week on the job. You want to inform yourself of the organization's standards/expectations of conducting everyday work ethically and responsibly. What might be examples of two of the company's documents you will read/consult? List them.
2. What might be examples of two offices/departments within a company that deal with issues pertaining to ethics?
3. Is there something amiss in the following scenarios; if yes, explain what's wrong and what you would do instead.
 - a. You usually save your work on your unencrypted flash drive because you can access your projects/official work anytime, anywhere.
 - b. You are cleaning your desk and you find papers from a project that you worked on a year ago. You have no use for them anymore; you tear them up and toss them in the trash can
4. The company you work for operates in different parts of the world; all branches of the companies, irrespective of the country they are located in, will be governed by the same set of data privacy rules. True or False – Circle one.
5. You receive an email from a potential supplier who believes that his product will be of use to the company you work for. He thinks talking business over lunch will be a good idea. He suggests a high-end restaurant in town. Your company, incidentally, is interested in the product and has been on the lookout for a supplier. You accept the lunch invitation. Did you do the right thing or did you violate any of your company code of ethics? If yes, identify the code and explain the violation.
6. You are careful not to make inappropriate jokes or discuss office gossip in emails to your close friend and colleague, John, because emails are considered more permanent and formal in nature. You, however, think it is alright to share crude jokes with John via the company's chat tool because chat communications are less informal and not permanent in nature like emails. True or False - Circle one and explain your response.
7. What, in your opinion, is considered an official record?
8. Your team leader (TL), with whom you share a good working relationship and whom you trust completely, walks up to you and tells you that she needs your signature on three forms that pertain to the project that you are currently working on. You immediately sign the forms without reading them and hand them back to your TL. These forms will be filed away in the company's headquarters. Did you do the right thing? Explain.
9. Confidential company information refers to information about the company that is not available to the public. Confidential information could also refer to information that has limited disclosure *within the company* True or False - Circle one. Explain your response
10. List three documents/records that might be considered confidential from a supply chain and purchasing perspective.
11. You meet your friend, who works as an HR professional in another company, for coffee. The conversation steers towards credit cards and credit scores. You had just conducted a credit check on a Bill Morrison, a potential supplier that day and you couldn't help but comment about Bill's terrible credit score. Did you do the right thing? Explain.
12. What do you need to think about before destroying e-documents? List two reasons. What code of ethics does this scenario fall under?
13. Supply chain and purchasing professionals occupy a **fiduciary position** in an organization. What is your understanding of this term?

Fig 17: Mechanical Engineering Pre/Post-test Questions

1. This is your first week on the job. You want to inform yourself of the organization's standards/expectations of conducting everyday work ethically and responsibly. What might be examples of two of the company's documents you will read/consult? List them.
2. What might be examples of two offices/departments within a company that deal with issues pertaining to ethics?
3. Confidential company information refers to information about the company that is not available to the public. Confidential information could also refer to information that has limited disclosure *within the company* True or False - Circle one. Explain your response
4. List three documents/records that might be considered confidential from a mechanical engineering perspective.
5. Some proprietary information is considered confidential. What is your understanding of the word proprietary? Give 2 examples of what might be considered confidential proprietary information.
6. The company you work for operates in different parts of the world; all branches of the companies, irrespective of the country they are located in, will be governed by the same set of data privacy laws. True or False – Circle one.
7. Is there something amiss in the following scenarios; if yes, **1)** explain what is wrong and **2)** identify the area in a company's code of conduct these scenario might fall under
 - a. You usually back-up company data and the reports you work on your personal unencrypted flash drive because you can access your projects/official work anytime, anywhere.
 - b. You were in charge of developing engineering design software for Company A. Because you developed the software, you decide to save a copy of this software onto your personal computer. After about a year you decide to join another company. The new company too tasks you with developing a software which is similar to the one you developed for Company A. For the sake of efficiency, you decide to adapt the software you developed for Company A to suit Company B's needs.
8. What, in your opinion, is considered an official record?
9. Explain the following terms with an example
 - a. Patent, b. Copyright, c. Intellectual Property, d. Trademark:
10. You are careful not to make inappropriate jokes or discuss office gossip in emails to your close friend and colleague, John, because emails are considered more permanent and formal in nature. You, however, think it is alright to share crude jokes with John via the company's chat tool because chat communications are less informal and not permanent in nature like emails. True or False - Circle one and explain your response.
11. Records management is an area that features prominently in many companies' code of ethics? What do you understand by this code? Explain the rationale behind this code?
12. Your uncle has recently started a firm that provides consultancy services to small, upstart engineering companies. He knows that you work as an engineer in Company X and thinks that you could be of great value to his firm. He would like you to work with him on the weekends writing reports etc. You think it's a great way to gain additional experience and earn some extra cash. You accept his offer. By accepting your uncle's offer, will you be violating any of company X's code of ethics? If yes, identify the code and explain the violation.
13. You are a manufacturing engineer. You occasionally work with Duncan, a vendor, who supplies parts and equipment to the company you work for. You discover that Duncan is a member of the upmarket Cherry Orchard Country Club. You've heard about the superior facilities the club offers. Duncan thinks that he can arrange for you to use the club for a week as a guest. You are thrilled and accept his offer. By accepting Duncan's offer, will you be violating any of your company's code of ethics? If yes, identify the code and explain the violation.
14. You are an environmental engineer. The company you work for regularly releases water effluents into the local lake, a flourishing tourist spot. As part of your job you monitor these discharges and submit a periodic report to the Department of Natural Resources. Your current report reveals that the discharges slightly exceed the legal limits. There is no reason to believe, however, that this will pose any danger to the tourists or locals. Your supervisor tells you that the excess is merely a 'technicality' and asks you to adjust the numbers so that the company appears to be in compliance. She also tells you that it will cost \$200,000 to fix the problem and the bad publicity will scare tourists away. What will you do?
15. You share a great working relationship with Linda and Jen, your colleagues at work. You find that at team meetings your supervisor, Mike, often discounts the contributions of Jen and Linda. You find this unfair and unethical. How might you address

As a first step, students' responses were coded/ranked as follows:

0 = wrong answer, 1 = partial score low, 2 = partial score high, 3 = full score

Then the Wilcoxon Signed Rank Test was run on the difference in ranking between the pre and the post-test. The Wilcoxon statistical test is nonparametric, meaning that it supports the analysis of data that is not normally distributed. Since the rankings of the scores are ordinal and therefore do not assume normality and because the samples are related, the Wilcoxon Single-Ranked test was an ideal choice (du Prel et al., 2010).

Wilcoxon test is used to test the hypothesis that the median difference between two treatment levels (in this case pre and post-test) is zero or less than zero, indicating an improvement (pre-test score minus post-test score). Figures 18 and 19 summarize the test results.

Fig. 18: Wilcoxon Signed Rank Test – Supply Chain

Test of median = 0.000000 versus median < 0.000000						
	N	N for Test	Wilcoxon Statistic	P	Estimated Median	
diff Q1	24	14	5.0	0.002	-0.5000	
diff Q2	24	7	3.5	0.045	0.000000000	
diff Q3a	24	6	2.0	0.047	0.000000000	
diff Q3b	24	6	8.5	0.377	0.000000000	
diff Q4	24	9	15.0	0.203	0.000000000	
diff Q5	24	17	4.0	0.000	-1.000	
diff Q6	24	8	4.5	0.034	0.000000000	
diff Q7	24	7	0.0	0.011	0.000000000	
diff Q8	24	1	1.0	0.977	0.000000000	
diff Q9	24	4	0.0	0.050	0.000000000	
diff Q10	24	10	0.0	0.003	-0.5000	
diff Q11	24	1	1.0	0.977	0.000000000	
diff Q12	24	13	4.0	0.002	-0.5000	
diff Q13	24	5	3.0	0.140	0.000000000	

Fig. 19: Wilcoxon Signed Rank Test – Mechanical Engineering

Test of median = 0.000000 versus median < 0.000000						
	N	N for Test	Wilcoxon Statistic	P	Estimated Median	
diff Q1	20	8	0.0	0.007	-0.5000	
diff Q2	20	8	0.0	0.007	-0.5000	
diff Q3	20	5	0.0	0.030	0.000000000	
diff Q4	20	5	0.0	0.030	0.000000000	
diff Q5	20	10	4.0	0.010	-0.5000	
diff Q6	20	4	2.5	0.233	0.000000000	
diff Q7a	20	2	0.0	0.186	0.000000000	
diff Q7b	20	4	3.0	0.292	0.000000000	
diff Q8	20	7	4.0	0.054	0.000000000	
diff Q9a	20	4	2.0	0.181	0.000000000	
diff Q9b	20	9	14.0	0.172	0.000000000	
diff Q9c	20	5	4.5	0.250	0.000000000	
diff Q9d	20	2	1.5	0.673	0.000000000	
diff Q10	20	5	0.0	0.030	0.000000000	
diff Q11	20	11	0.0	0.002	-1.500	
diff Q12	20	12	10.5	0.014	-1.000	
diff Q13	20	10	0.0	0.003	-1.000	
diff Q14	20	0		20	0	

Figure 18 shows that the post-test supply chain scores for questions 1, 2, 3a, 5, 6, 7, 9, 10 and 12 are statistically higher than the pre-test. No statistical significance was found for questions 3b, 4, 8, 11, 13.

Figure 19 shows that the post-test mechanical engineering scores for questions 1, 2, 3, 4, 5, 8, 10, 11, 12, 13 were statistically higher than the pre-test. No statistical significance was found for questions 6, 7a, 7b, 9a, 9b, 9c, 9d, 14, 15.

QUALITATIVE ANALYSIS RESULTS

This section pertains to the qualitative portion of my study which is addressed by the second research question and its accompanying hypotheses (hypothesis 2a and 2b) -

What are the students' attitude towards the situated nature of the content and the fact that it was facilitated by an experienced professional from the industry?

Hypothesis 2 a: Students will find the situated nature of the content gives them a sense of how to apply classroom learning of ethics in a workplace context.

Hypothesis 2 b: Students will appreciate the organizational context provided by the experienced professional.

Supply Chain Qualitative Response Summary

1. Why should you (who will be graduating and entering the workplace shortly) be aware and informed about organizational codes of ethics/ conduct? What does being an aware and informed professional have to do with being an ethical practitioner?

Fig: 20: Why Be Aware of Organizational Codes (No. of responses 20/24)

	Response type	No. of responses
1	To protect self/company's reputation/public	6
2	To make informed decisions based on organization's codes; not based on gut feeling	11
3	To prevent legal complications/disputes	2
4	To know how to report unethical behavior	1

2. While this discussion centered on a particular company's code of ethics, what, in your opinion, was the larger objective of this discussion/exercise?

Fig 21: Larger Objective of the Session (No. of responses 5/24)

	Response type	No. of responses
1	To ask questions when in doubt	1
2	To show how ethics is practiced in real life/by companies	2
3	To learn acceptable behavior/help our future career	1
4	To learn consequences of ethical missteps	1

3. Did it matter that an industry representative facilitated this session? List your reasons.

Fig 22: Value Provided by Experienced Professional (No. of responses 18/24)

	Response type	No. of responses
1	No (no reason provided)	1
2	Yes –showed specific examples of situations we may face in the future	2
3	Yes – practical/showed real-world application in a company/acts as a good baseline	11
4	Yes - helped me recall a few items	1
5	Yes - learning from authority figure who experiences ethical situations on a routine basis - adds value/credibility	3

4. If you had taken an ethics course before or if ethics was a component of a course that you took, in what ways were those discussions different from this session?

Fig 23: Value of Prior Ethics Instruction (No. of responses 9/24)

	Response type	No. of responses
1	Similar/No difference	1
2	Bookish/no context/broad/general/theoretical	8

5. List points from today's presentation/discussion that caught your attention or found particularly noteworthy. Explain why.

Fig 24: Session Points/Topics That Were Noteworthy (No. of responses 7/24)

	Response type	No. of responses
1	None	1
2	Had a general understanding of concepts but learned how ethics is applied	2
3	Got a clear understanding of topics because specific examples within Harley-Davidson were discussed	1
4	Learned some wrong-turn examples	1
5	Made me think outside the box about ethics	1
6	Reinforced my understanding of concepts	1

Fig 25: Consolidated Supply Chain Qualitative Responses by Work Experience

Work experience	Type of response	No. of responses
In Supply Chain	Yes was helpful: <ul style="list-style-type: none"> - Showed me how ethics is applied in an actual company - Presenter shared specific examples which showed me situations I may face in the future - Knowledge of codes will help in my decision making - Taught me what acceptable behavior is and how to stay out of trouble - An experienced professional presenting the topic added value 	10
In Supply Chain	Did not respond	2
Other Work Experience	Yes was helpful: <ul style="list-style-type: none"> - Showed me how ethics is applied in an actual company; - Presenter shared specific examples which showed me situations I may face in the future; - Knowledge of codes will help in my decision making; - Taught me what acceptable behavior is and how to stay out of trouble - An experienced professional presenting the topic added value 	7
Other	Did not make a difference	1
No Work Experience	Yes was helpful: <ul style="list-style-type: none"> - Showed me how ethics is applied in an actual company; - Presenter shared specific examples which showed me situations I may face in the future; - Knowledge of codes will help in my decision making; - Taught me what acceptable behavior is and how to stay out of trouble - An experienced professional presenting the topic added value 	4

Sample Student Qualitative Responses

1. Why should you (who will be graduating and entering the workplace shortly) be aware and informed about organizational codes of ethics/ conduct? What does being an aware and informed professional have to do with being an ethical practitioner?

Knowing company policies and where to go if need be you know your rights/responsibilities, you should never have a problem.

(Being informed is knowing company policies and where to go if need be; if you know your rights/responsibilities you should never have a problem)

As an aware and informed professional I would say that you are up to date with new protocols or rules within a work place. In doing so, you can gain trust from the company and others to do a good job.

(As an aware and informed professional I would say that you are up to date with new protocols or rules within a workplace; in doing so you can gain trust from the company and others to do a good job)

Business is constantly changing so you need to constantly know what is happening around you.

Being ethical you are also looking out for others' unethical behavior.

(Business is constantly changing so you need to constantly know what is happening around you; being ethical you are also looking out for others' unethical behavior)

It means that you are constantly learning and thinking about the decisions you make. Ethical standards may change between companies and it is important to be aware of this.

(It means that you are constantly learning and thinking about the decisions you make; ethical standards may change between companies and it is important to be aware of this)

2. While this discussion centered on a particular company's code of ethics, what, in your opinion, was the larger objective of this discussion/exercise?

It gave me insight to how an actual company operates as far as their legal conduct and other ethical issues.

(It gave me insight to how an actual company operates as far as their legal conduct and other ethical issues)

It taught me that it is important to ask questions if you are unsure about whether you are making an ethics violation.

(It taught me that it is important to ask questions if you are unsure about whether you are making an ethics violation)

3. Did it matter that an industry representative facilitated this session? List your reasons

it was nice to hear it from somebody who experiences this as a living ~~one~~

(It was nice to hear it from somebody who experiences this as a living)

Most certainly. It was great to have someone from a very well known company.

(Most certainly – it was great to have someone from a very well-known company)

Yes, he was able to provide specific examples and show that we will be put in these situations in ~~the~~ the future.

(Yes – he was able to provide specific examples and show that we will be put in these situations in the future)

Yes, Good realistic look on a well known company.

(Yes - Good realistic look on a well-known company)

I thought it was beneficial to actually see how ethics are implemented in an organization.

(I thought it was beneficial to actually see how ethics are implemented in an organization)

4. If you had taken an ethics course before or if ethics was a component of a course that you took, in what ways were those discussions different from this session?

They ^{were} more, straight from a book
 NO context behind it.

(They were more straight from a book; no context behind it)

I knew the material but it was nice to see how it was implemented.

(I knew the material, but it was nice to see how it was implemented)

Similar discussions, but nice to see it applied to the real world with an actual company

(Similar discussions, but nice to see it applied to the real world with an actual company)

Yes, we based material more on theories than code of a business,

(Yes, we based material more on theories than code of business)

They were more broad and didn't focus on one company

(They were more broad and didn't focus on one company)

5. List points from today's presentation/discussion that caught your attention or found particularly noteworthy. Explain why.

The class seemed to really focus on conflicts of interest and gift giving ... maybe more material on that subject

(The class seemed to focus on conflicts of interest and gift givingmaybe more material on that subject; learned how companies differ)

Continued to show importance in my current job to be aware of conflict of interest.

(Continued to show importance in my current job to be aware of conflict of interest)

Mechanical Engineering Qualitative Response Summary

1. Why should you (who will be graduating and entering the workplace shortly) be aware and informed about organizational codes of ethics/ conduct? What does being an aware and informed professional have to do with being an ethical practitioner?

Fig 26: Why Be Aware of Organizational Codes (No. of responses 20/20)

	Response type	No. of responses
1	To protect self/company's reputation/public	8
2	To make informed decisions based on org codes; not based on gut feel	6
3	To prevent legal complications/disputes	4
4	To know how to report unethical behavior	2

2. While this discussion centered on a particular company's code of ethics, what, in your opinion, was the larger objective of this discussion/exercise?

Fig 27: Larger Objective of the Session (No. of responses 17/20)

	Response type	No. of responses
1	To ask questions when in doubt	1
2	To show how ethics is practiced in real life	9
3	To learn acceptable behavior/help our future career	6
4	To learn consequences of ethical missteps	1

3. Did it matter that an industry representative facilitated this session? List your reasons.

Fig 28: Value Provided by Experienced Professional (No. of responses 18/20)

	Response type	No. of responses
1	No (no reason provided)	1
2	Yes –showed specific examples of situations we may face in the future	2
3	Yes – practical/showed real-world application in a company/acts as a good baseline	11
4	Yes - learning from an experienced engineer from a well-known company who experiences ethical situations on a routine basis adds value/credibility	4

4. If you had taken an ethics course before or if ethics was a component of a course that you took, in what ways were those discussions different from this session?

Fig 29: Value of Prior Ethics Instruction (No. of responses 7/20)

	Response type	No. of responses
1	No difference (had no prior ethics instruction)	1
2	Cannot recall what I learned (if you don't practice it you are likely to forget it)	1
3	This was more in depth/relates to the real world	3
4	Previous sessions were broad less specific	2

5. List points from today's presentation/discussion that caught your attention or found particularly noteworthy. Explain why.

Fig 30: Session Points/Topics That Were Noteworthy (No. of responses 15/20)

	Response type	No. of responses
1	The org codes, how to respond to situations, understanding consequences	2
2	Patent laws and how they work	4
3	The fine line between bribery and non-bribery	1
4	Using examples from within the company as well as examples from current happenings	2
5	Ethics policies as it applies to offshore operations	1
6	Ethical conduct regarding digital data and electronic communication	3
7	Employee rights – this will affect me	1
8	What constitutes public disclosure	1

Fig 31: Consolidated Mechanical Engineering Qualitative Responses by Work Experience

Work Experience	Type of response	No. of responses
In Mechanical Engineering	Yes was helpful: <ul style="list-style-type: none"> - Showed me how ethics is applied in an actual company; - Presenter shared specific examples which showed me situations I may face in the future; - Knowledge of codes will help in my decision making; - Taught me what acceptable behavior is and how to stay out of trouble - An experienced professional presenting the topic added value 	18
No Work Experience	Yes was helpful: <ul style="list-style-type: none"> - Showed me how ethics is applied in an actual company; - Presenter shared specific examples which showed me situations I may face in the future; - Knowledge of codes will help in my decision making; - Taught me what acceptable behavior is and how to stay out of trouble - An experienced professional presenting the topic added value 	2

Sample Student Qualitative Responses

1. Why should you (who will be graduating and entering the workplace shortly) be aware and informed about organizational codes of ethics/ conduct? What does being an aware and informed professional have to do with being an ethical practitioner?

Instead of working on homework problems
I will be addressing issues pertaining to peoples
lives – much more important to be ethical.

(Instead of working on homework problems I will be addressing issues pertaining to people's lives – much more important to be ethical)

We need to be aware of codes because we
might be faced with a decision that will require
us to remember certain codes. Sometimes a gut
reaction is not correct and could lead to a costly error.
Knowing these codes can help us act responsible
in a difficult situation where we won't
get into legal precautions later.

(We need to be aware of codes because we might be faced with a decision that will require us to remember certain codes. Sometimes a gut reaction is not correct and could lead to a costly error. Knowing these codes can help us act responsible in a difficult situation where we won't get into legal precautions later)

Because they can greatly affect your life in many situations. If you are not aware and informed, you will not know what is truly ethical.

(Because they can greatly affect your life in many situations. If you are not aware and informed, you will not know what is truly ethical)

I need to be informed because my job will depend on it. I may come across situations where understanding ethics/conduct will help me make a better decision for myself and my company.

(I need to be informed because my job will depend on it; I may come across situations where understanding ethics/conduct will help me make a better decision for myself and my company)

It makes me a better engineer. It will allow me to do a better job and make sure the product is safe and keep everyone safe.

(It makes me a better engineer; it will allow me to do a better job and make sure the product is safe and everyone is safe)

To help us realize when we are in or see a situation that might be unethical and know how to report it. If you are aware of the rules & guidelines you are more likely to follow them

(To help us realize when we are in or see a situation that might be unethical and know how to report it. If you are aware of the rules and guidelines you are more likely to follow them)

2. While this discussion centered on a particular company's code of ethics, what, in your opinion, was the larger objective of this discussion/exercise?

To make us think about if we were in this situation and what we would do.

(To make us think about if we were in this situation, what we would do)

To learn about and spread awareness regarding these topics. They are valuable and critical to our futures.

(To learn about and spread awareness regarding these topics. They are valuable and critical to our futures)

TO GAIN INSIGHT TO THE IMPORTANCE OF ETHICS
AND HOW IT RELATES TO COMPANIES AND EMPLOYEES.

(To gain insight to the importance of ethics and how it relates to companies and employees)

The objective was to help us understand how to act ethically when faced with a certain situation not just a company's code but how to conduct ourselves

(The objective was to help us understand how to act ethically when faced with a certain situation...not just a company's code but how to conduct ourselves)

3. Did it matter that an industry representative facilitated this session? List your reasons.

Yes, his examples from industry made it more interesting & real

(Yes, his examples from industry made it more interesting and real)

Yes because real life situations were used that and we could be faced with similar situations

(Yes, real-life situations were used and we could be placed with similar situations)

yes.

• He knows the work environment

He can tell us his experience firsthand

(Yes – he knows the work environment – he can tell us his experience first-hand)

Yes, they represent first hand knowledge of the matter

(Yes, they represent first-hand knowledge of the matter)

Gives better understanding of corporate culture

(Gives better understanding of corporate culture)

Yes - real world examples
 - professional examples
 - better understanding ~~of~~ coming from
 Engineer & Lawyer

(Yes, real world examples; professional examples; better understanding coming from engineer and lawyer)

Yes, because the information is always more valuable coming from an experienced, knowledgeable professional.

(Yes - because the information is always more valuable coming from an experienced, knowledgeable professional)

4. If you had taken an ethics course before or if ethics was a component of a course that you took, in what ways were those discussions different from this session?

It gives real world context
 (not just some Academic preaching)

(It gives real world context; not just some academic preaching)

They were taught a little more
high level, less specific.

(They were taught a little more high level; less specific)

I can not recall because without application,
things are lost. Like learning a language,

(I cannot recall because without application, things are lost; like learning a language)

5. List points from today's presentation/discussion that caught your attention or found particularly noteworthy. Explain why.

Public disclosures

↳ I didn't know that telling a ~~friend~~ friend
as a public disclosure.

(Public disclosures; I didn't know that telling a friend counted as a public disclosure)

Unencrypted data because there is such a
grey area here since it is so new.

(Unencrypted data because this is such a grey area since it is so new)

Patents, as an engineering major, I am very interested in eventually applying what I've learned in order to invent new devices.

(Patents, as an engineering major, I am very interested in eventually applying what I have learned in order to invent new devices)

PATENT LAWS AND HOW PATENTS WORK ARE ALWAYS INTERESTING.

(Patent laws and how patents work are always interesting)

CHAPTER 5: DISCUSSION

QUANTITATIVE RESULTS DISCUSSION

Aggregate Level Analysis

An aggregate level analysis was done to test the first and second hypotheses of my first research question:

Hypothesis 1 a: Prior to the intervention, students will have a general understanding of the six codes used in this study.

Hypothesis 1 b: The study intervention will provide the students with a situated/organizational understanding of the six areas of organizational codes.

Hypothesis 1a Discussion.

To measure Hypothesis 1a, I used the supply chain and mechanical engineering pre-test mean (standard deviation) scores reported in Figures 14 and 15 as 18.542 (3.526) and 23.6 (4.297) respectively. Since these mean values are both markedly above zero, it can be inferred that students had a base understanding of the six codes in this study. In addition, the values of the standard deviations (3.526 and 4.297) indicate slight variability in their level of prior understanding (quite small compared to the mean). Yet there is similarity in the variability of prior understanding between the two cohorts (F-test p -value = 0.364). Statistically, it is desirable to have standard deviations that are much lower than the mean, indicating minimal variability in performance across participants in the study.

Further analysis was conducted on the supply chain and mechanical engineering pre-test scores to assess the extent of the students' base knowledge for each question. This analysis involved a tally of the number of students who had a score of less than 2 (i.e. no knowledge = 0, partially low knowledge = 1) for each question (Tables 2 and 3).

Fig 32: Supply Chain Heat Chart Indicating No. of Students Who Scored < 2

No. of Students with Scores < 2			
Question	Related Code	Pre-test	Post-test
Q 1	Organizational resources to consult	5	0
Q 2	Reporting procedures	1	0
Q 3a	Records management & information security	5	2
Q 3b	Records management & information security	2	2
Q 4	Confidentiality & data privacy	11	8
Q 5	Conflict of interest	22	9
Q 6	Electronic communication	0	0
Q 7	Records management & information security	9	2
Q 8	Confidentiality & data privacy	0	0
Q 9	Confidentiality & data privacy	0	0
Q 10	Confidentiality & data privacy	5	0
Q 11	Confidentiality & data privacy	0	1
Q 12	Records management & information security	18	8
Q 13	Organizational resources to consult	8	5

The pre-test scores for supply chain in Figure 32 indicates that though the students had prior knowledge about most organizational codes, their understanding was particularly low for questions 4, 5, 7, and 12 (indicated by increasing shades of red). Question 4 was a true or false question about data privacy as it would apply to multinational organizations; being at the periphery of their profession with minimal or no exposure to international work environment, it is not surprising that almost half the class scored

poorly on this question. Question 5 pertained to a conflict of interest situation and almost the entire class scored less than 2; students were unable to provide a rationale for their response in the pre-intervention stage. Questions 7 and 12 pertained to records management and information security. Question 7 asked students to define/explain an official record and question 12 pertained to the management of e-documents.

Fig 33: Mechanical Engineering Heat Chart Indicating no. of students who scored < 2

No. of Students with Scores < 2			
Question	Related Code	Pre-test	Post-test
Q1	Organizational resources to consult	3	1
Q2	Reporting procedures	0	0
Q3	Confidentiality & data privacy	2	0
Q4	Confidentiality & data privacy	4	0
Q5	Confidentiality & data privacy	7	4
Q6	Confidentiality & data privacy	8	6
Q7a	Electronic communication	4	3
Q7b	Records management & information security	3	1
Q8	Records management & information security	11	6
Q9a	Records management & information security	2	1
Q9b	Records management & information security	9	7
Q9c	Records management & information security	12	9
Q9d	Records management & information security	1	1
Q10	Electronic communication	0	0
Q11	Records management & information security	10	2
Q12	Conflict of interest	11	4
Q13	Conflict of interest	9	1
Q14	Reporting procedures	0	0
Q15	Reporting procedures	1	1

The pre-test scores for mechanical engineering in Figure 33 indicates that though the students had prior knowledge about most organizational codes, their understanding was particularly low for questions 5, 6, 8, 9b, 9c, 11, 12, and 13 (indicated by increasing shades of red). While questions 3, 4, 5, 6 pertained to questions on confidentiality and data privacy, question 3 was a simple true or false question and question 4 asked students to list examples of mechanical engineering documents that might be considered confidential. Considering that most students had relevant internship experiences, it wasn't surprising that students demonstrated higher level of knowledge in these areas. Question 5 on the other hand asked students to list examples of proprietary information that may be considered confidential and question 6 was about data privacy as it would apply to multinational organizations. An understating about these areas perhaps comes from being full members of a communities of practice rather than from short internship or peripheral experiences. It is not surprising then that close to 50% of the class demonstrated minimal understanding of the organizational codes addressed by questions 5 & 6. Students also were not able to define intellectual property (question 9C) and copyright (question 9b) but they had a fairly good understanding of what patents and trademark meant probably because the definitions of patents and trademarks are fairly more concrete and less ambiguous (while the number of students scoring < 2 in the post-test for question 9 b and 9c did come down, the reduction is marginal indicating that students need more instruction in these two areas). Questions 8 and 11 were regarding records management and information security. Question 8 asked students to define an official record and question 11 asked

students to explain the rationale behind organizational code on records management. Questions 12 and 13 pertained to conflict of interest situations. For these questions students were unable to provide a rationale for their responses (the post test scores show that after listening to the practitioner deconstruct the scenario, they were able to provide more specific, situated responses, responses that were based on the organizational codes).

Hypothesis 1b Discussion.

The paired T-tests results in Figures 14 and 15 indicate that the p-values of both the supply chain and mechanical engineering classes are significantly below the alpha value of 0.05. It can, therefore, be concluded that there was an overall statistical improvement in the post-test performances of both the cohorts and the improvement can be attributed to the intervention. In addition, the 95% confidence intervals in the differences in performance between the pre and post-test for the supply chain and mechanical engineering cohorts i.e. [-5.623 to -3.210] and [-7.589 to -5.011] indicate that the mechanical engineering class demonstrated a marked improvement than the supply chain cohort, possibly because they attempted the pre and post-test on two separate days. Since the supply chain students attempted the pre-test, post-test and the post-reflection in one session, fatigue could have played a role in the relatively lower level of performance. Additionally, the reduced standard deviations in the post-test from the pre-test in both cohorts i.e. from 3.526 to 2.545 for supply chain and from

4.297 to 3.386 for mechanical engineering shows that perhaps the intervention was successful in the attempt to harmonize the responses.

Question by Question Analysis: Hypothesis 1c Discussion

A question by question analysis was done to test the third hypothesis (hypothesis 1c) of my first research question:

Hypothesis 1 c: The impact of the intervention will be significantly higher for the questions/scenarios that require the students to explain the rationale behind and the consequences of the six organizational codes.

The Wilcoxon Signed Rank Test results reveal that this hypothesis was found to be true for both the supply chain as well as the mechanical engineering cohorts. The value/impact of the intervention was also high for some questions that did not require analysis.

Post-Test Responses That Indicate a Statistical Improvement from the Pre-Test: Supply Chain

According to the Wilcoxon Signed Rank Test results (Figure 18), responses to questions 1, 2, 3a, 5, 6, 7, 10 and 12 showed statistical significance in the post-test for the supply chain cohort. Questions 1 dealt with organizational resources that students would consult to inform themselves of ethical policies and question 2 dealt with reporting procedures. These questions required little reasoning on the part of the students. The improvement as shown in Figure 32 indicates that while a total of six students scored

less than 2 in the pre-test, the post-test scores indicate that all students were able to correctly respond to both questions. Questions 3a, 7 and 12, pertained to records management and information security, questions 5 and 10 dealt with confidentiality and data privacy and question 6 dealt with electronic communication. Except question 10 (which asked students to provide examples of three documents that might be considered confidential from a supply chain perspective), questions 3a, 7, 12, 5, and 6 required students to provide a rationale for their responses and to explain the consequences of non-compliance. While performance in the post-test for all these questions showed general improvement, the impact of the intervention was greatest for question 5 and 12 as indicated in Figure 32. A possible reason why students needed the help of intervention for question 10, (even though it did not require any form of analysis) could be because half the class do not have relevant work experience (Figure 3), and therefore had little knowledge of supply chain documents that could be considered confidential.

Post-Test Responses That Did Not Indicate a Statistical Improvement from the Pre-

Test: Supply Chain

According to the Wilcoxon Signed Rank Test results (Figure 18), responses to questions 3b, 4, 8, 9, 11, and 13 did not indicate a statistical improvement in the post-test.

Questions 4 and 9 were true or false questions pertaining to confidentiality and data privacy. Question 3b pertained to a question on how students would dispose hard copies of papers from an old project. Almost all students, in the pre as well as the post-

test, said that they would shred or ask the legal department about an appropriate way of disposing off the documents as it had to do with issues of confidentiality and data privacy. Question 8 asked students if they would read documents given to them by their team leader before signing them. Question 11 asked students if they would share the credit scores of a potential supplier with a close friend and question 13 asked students to define the term fiduciary. Most students got these questions right in both the pre and post-test. The questions were admittedly simple and less challenging. However, these questions were included because the practitioner thought that these scenarios were important and also because they would indicate the extent of students' basic knowledge. Student responses were prudent and thoughtful as the following sample student responses to the question on sharing credit score information reveal

1. *"No, this is very personal information that should not be shared with anyone who doesn't need it in order to make a decision about Bill being a supplier"*
2. *"No, credit scores are confidential information. Doing this actually violates federal law"*

To the question on whether they would sign documents without reading them, below are sample responses

3. *"Not unless you already know what the forms said. If there is a problem, it falls on you now"*
4. *"I always want to know what I am signing. The few minutes this generally takes will be well worth the avoidance of possible issues later"*

Post-Test Responses That Indicate a Statistical Improvement from the Pre-Test:**Mechanical Engineering**

Questions 1, 2, 3, 4, 5, 8, 10, 11, 12, 13 showed statistical significance in the post-test.

These questions cover five out of the six areas of organizational codes used in this study.

Except for questions 1, 2, 3, and 4 all the other questions required students to provide a rationale for their responses and to explain the consequences of non-compliance. This data indicates the value of the intervention for questions that required analysis as well as for questions that did not.

Post-test Responses That Did Not Indicate a Statistical Improvement from the Pre-test:**Mechanical Engineering**

According to the Wilcoxon Signed Rank Test results (Figure 19), responses to questions 6, 7a, 7b, 9a, 9b, 9c, 9d, 14 and 15 did not indicate a statistical improvement in the post-test. Questions 6 was a true or false question on data privacy. Questions 7a dealt with electronic communication and 7b dealt with records management and information security. Questions 9a, b, c, d pertained to intellectual property and questions 14 and 15 dealt with reporting procedures. Questions 6, 14 and 15 were straightforward requiring no analysis on the part of the students. For questions 7a and b and 9 a, b, c, and d, the degree of improvement from the pre to the post was marginal. Students had prior knowledge about the scenarios addressed by these questions but despite the intervention, the post-test scores did not see a marked improvement. This could indicate the need for more instruction in these areas. Questions on intellectual property

are of particular relevance to engineering students. According to Ballantine (2008), intellectual property is an important topic of learning for engineering students. He says, “Intellectual property is a natural successor to ethics and an important subject matter like plagiarism....While many engineers may not be directly involved in writing a patent application or securing a trademark, any number of engineering communications, such as memos, product documentation, requirement specifications, journal entries, or progress reports, will be used by managers and lawyers to obtain protection from one of the facets of intellectual property law”.

Overall, for supply chain as well as mechanical engineering, the Wilcoxon Signed Rank Test results prove hypothesis 1c to be true. While there was no quantitative improvement in the post-test responses for some questions, what is interesting to note is the thought process behind the responses which range from simplistic to practical. For example, to the question on public safety (question 14 in mechanical engineering) some of the responses were

1. *“Go to your supervisor’s supervisor and explain the situation - This is unacceptable and repercussions will come your way when the DNR finds out, do what is moral and right”*
2. *“Attempt to persuade her; if not compliant then address issue to government official and probably lose my job”*
3. *“Don’t cover it up; check to see if past reports show systemic issues with violations (is this a fluke)”*

4. *“Abide by legal standards as my name will be on the report”*
5. *“I would report this up the help chain. First a higher level manager, then HR, then legal department”.*

To the question on gender discrimination (question 15 in mechanical engineering) some of the student responses were

6. *“Discuss the matter with an HR rep who deals with these matters”*
7. *“Bring it up to your supervisor and hope he doesn’t scold you”*
8. *“Bring it up to Jen and Linda’s attention and let them address it”*

While some responses are insightful and reflect critical thinking such as *“Don’t cover it up; check to see if past reports show systemic issues with violations (is this a fluke)”* (I won’t do the wrong thing but I’m going to investigate this further before I come to a conclusion), some responses are simplistic such as *“Bring it up to your supervisor and hope he doesn’t scold you”* (I’ll do the right thing but I’m apprehensive of the consequences).

Students’ responses in both the supply chain and mechanical engineering show a range of thought processes. Having students’ discuss metacognitively with the practitioner about the rationale for their responses in the post-test would have proven to be immensely beneficial to the students. Unfortunately, due to time constraints, students did not have an opportunity to discuss their post-test responses with the practitioner. While the practitioner had sufficient opportunities to “make visible”, as Brown et al.

(1989) would say, his thought processes to the students, shortage of time limited the opportunities for students to make visible their thought processes to the practitioner.

QUALITATIVE DATA DISCUSSION

This portion of the study addresses my second research question and its accompanying hypotheses

What are the students' attitude towards the situated nature of the content and the fact that it was facilitated by an experienced professional from the industry?

Hypothesis 2 a: Students will find that the situated nature of the content enables them to apply classroom learning of everyday ethics in a workplace context.

Hypothesis 2 b: Students will appreciate the organizational context provided by the experienced professional.

It is evident from the Figures 25 and 31 (consolidated supply chain and mechanical engineering responses) that all students in the mechanical engineering class and almost all students in the supply chain class appreciated the cultural/organizational context the instruction provided them. The business students as well as the engineering students were unanimous in saying that they

- Found it useful to learn, through examples provided by the industry professional from within the organizational context, how ethics is practiced/applied/implemented in a company
- Appreciated learning about the different cultural tools (organizational codes and policies, people and departments, and other facilities and mechanisms put in place by an organization) that they can take advantage of to help them in making ethical decisions or to consult when in doubt

In the following sections, I highlight some of the themes that stood out from student responses from two study cohorts.

Situated/Contextual Learning Helps Connect the Knowing and the Doing

This is evident from the following student responses

- *“I knew the material, but it was nice to see how it was implemented”*
- *“Similar discussions (in my prior ethics instruction), but nice to see it applied to the real world with an actual company”*
- *Gives better understanding of corporate culture*
- *“Awareness is always better than being uninformed; having the tools and information and help procedures will make you a more engaged employee”*
- *“Real-life situations were used and we could be placed in similar situations”*
- *“We got an insight on more specific examples instead of general ones; it was helpful because we focused solely on Harley-Davidson”*

On the other hand, the following responses from students show that prior instruction in ethics (standalone and/or disciplinary ethics), while being educational, has not been successful in showing to them how the knowledge will be implemented when they join companies. This disconnect between theoretical knowledge and practice occurs in learning environments that don't take into consideration the cultural context in which the knowledge will be applied.

- *“Instead of working on homework problems I will be addressing issues pertaining to people’s lives – much more important to be ethical”*
- *“They (prior ethics instruction) were more straight from a book; no context behind it”*
- *“You know there is some truth to the story; showing real-life examples not book examples”*

The above responses from students is consistent with the findings of the study conducted by Professor McGinn from Stanford University (as cited in Colby & Sullivan, 2008) which indicated that engineering ethics instruction did little to prepare the students for the workplace. According to his study, “significant gaps exist between the ethical realities of engineering practice and preparation for those realities in engineering schools”. Students in his survey reported that “they believed it is important to be a ‘professional’ as it is to be a technical expert but only a small percentage said they had learned anything specific from their engineering courses about what that entailed”. Participants in an accompanying survey of practicing engineers said that “they regularly face ethical issues in their work” but most did not feel that “they were adequately prepared to handle those issues”. This gap between learning about practice but not about what it means to be a practitioner consistently emerges in literature on undergraduate engineering and business ethics instruction. Situated learning approaches aim to address this separation of the learning from the doing or knowledge and practice.

According to situated learning principles, “learning that occurs within the context of application is considered more likely to result in improved practice” (Dennen & Burner, 2007). This is because “cognition is an intricately interwoven and conditionally-sensitive process” (Choi & Hannafin, 1995) that references the relations among people, tools, and the activity itself of the target context. “Learning is ‘tool dependent’ because the setting provides mechanisms (computers, maps, measuring cups) that aid, and more important, structure the cognitive process; (Wilson as cited in Hansman, 2001). According to Duncan (1996), closer the match between the learning situation and the ultimate workplace situation, the easier the transfer will be.

Organizational/Cultural Tools Help in Decision Making

Organizational codes and related policy documents act as important cultural tools that guide members of a community of practice in decision making, especially those who are young and fresh out of college and starting their careers. Given that the youngest employees of a workforce have little life experience to draw from to help them identify and manage ethical situations (Ethics Resource Center Survey, 2009, 2011), organizational codes can act as important resources that they can consult preemptively or when faced with an ethical dilemma. Broad, generic, decontextualized professional codes, as Buchholtz (1989) points out, would offer little help to an inexperienced member of a community of practice.

Organizational codes can be used effectively as learning content in situated ethics instruction; this is demonstrated by the following reflective statements of the students

- *“We need to be aware of codes because we might be faced with a decision that will require us to remember certain codes. Sometimes a gut reaction is not correct and could lead to a costly error. Knowing these codes can help us act responsible in a difficult situation where we won’t get into legal precautions later”*
- *“Being informed is knowing company policies and where to go if need be; if you know your rights/responsibilities you should never have a problem”*
- *“As an aware and informed professional I would say that you are up to date with new protocols or rules within a workplace; in doing so you can gain trust from the company and others to do a good job”*
- *“One must be informed of SOPs, practices, and guides; know your surroundings and who may cause harm”*
- *“(The point that caught my attention was) just understanding the list of ethical codes and how we can conduct ourselves in situations; knowing the different precautions to take when using information in a company”*

According to situated learning principles, content is informed by the context or in other words content and authentic context are interdependent. Content and context act “as a guide for the student to engage in an activity by providing the student a sense of situational intent. The authentic context, both cues the learner to situational resources

and serves as an advance organizer for related problem solving contexts” (Choi & Hannafin, 1995).

Students Found Value in Learning from an Experienced Practitioner from Their Profession

Two things were evident from student responses 1) it was important to them that the practitioner had several years of experience behind him and that he was an authority figure from a well-known company. This characteristic of the Millennials of trusting and looking up to authority figures for guidance is reflected in the literature review on Millennials 2) the students found it beneficial that the experienced practitioner revealed to them his thought process and rationale for dealing with various examples of ethical situations thereby indicating the value of cognitive apprenticeship approach to ethics instruction . The following student comments reveal these sentiments

- *“It helps to have someone explain current state; real-life situations/ practices provides a good baseline”*
- *“He was able to provide specific examples and show that we will be put in these situations in the future”*
- *“His examples from industry made it more interesting and real”*
- *“Actual people from industry – validated his claims – real-world examples”*
- *“He knows the work environment – he can tell us his experience first-hand”*
- *“it is more meaningful coming from someone who works in the engineering industry and has experience”*

According to situated learning, when an expert practitioner models the thought process underlying the performance such as explaining why certain procedures are in place or why certain tools and implements are used for specific functions, it helps learners integrate *what* occurs with *why* it occurs” (Choi & Hannafin, 1995). This process is referred to as cognitive modelling where the expert shares with the novice learners the ‘tricks of the trade’. The ‘tricks of the trade’ provides the learners with, as one student’s feedback pointed out, a ‘baseline’ or a foundation to start from. When students eventually join places of work, they don’t have to learn from trial and error or ‘gut feel’ as another student’s feedback pointed out but rather they can proactively consult and learn from authentic cultural tools and resources.

Session Found Beneficial By Those with and Without Work Experience

Figures 3 and 6 shows that students with prior work experience (through internships, coops, and/or full time work) found equal value in the session as did those without work experience. For those who have industry experience, it can be inferred that the focus of their internships and coops was more on gaining work experience and technical competence rather than on learning how ethics is practiced within a company. Therefore, situated ethics instruction can act as a socialization process into world of work for those with and without work experience.

A couple of students with work experience mentioned that the session helped reinforce/clarify understanding of ethical concepts; this too can be an important objective/outcome of situated learning experiences.

- *“Continued to show importance in my current job to be aware of conflict of interest”*
- *“It helped me recall a few items”*

Need To Situate Ethics Instruction in the Organizational Context As Well As the Professional Context

Considering that supply chain professionals interact with suppliers, vendors and various other external stakeholders, conflict of Interest especially as it pertains to accepting gifts, seemed to dominate class discussion with the supply chain professional from Harley Davidson. This is reflected in the following comment

- *“The class seemed to focus on conflicts of interest and gift givingmaybe more material on that subject”*

With the mechanical engineering students, while conflict of interest (as it applies to the mechanical engineering field) was an important topic, students were more interested in knowing from the mechanical engineering professional from GE Healthcare, about patents, data privacy and confidentiality. This is reflected in the following comment

- *“Patents, as an engineering major, I am very interested in eventually applying what I have learned in order to invent new devices”*

Ethics instruction as it applies to a particular profession is important as is situating that instruction in an organizational/cultural context so that students can see how knowledge of professional ethics is applied in practice.

Students' Metacognitive Responses Were Practical

Students' responses to the following metacognitive questions - 'While this discussion centered on a particular company's code of ethics, what, in your opinion, was the larger objective of this discussion/exercise?' and "What does being an aware and informed professional have to do with being an ethical practitioner?' were practical and thoughtful at the same time. The following responses demonstrate this

- *"The objective was to help us understand how to act ethically when faced with a certain situation...not just a company's code but how to conduct ourselves"*
- *"To make sure to not violate any and be an ethical engineer and person; it is our own responsibility to know of these codes so we should take responsibility for ourselves"*
- *"Business is constantly changing so you need to constantly know what is happening around you ; being ethical you are also looking out for others' unethical behavior"*
- *"To give the student an awareness that being a professional is more than doing a 'good job'"*
- *"It makes me a better engineer; it will allow me to do a better job and make sure the product is safe and everyone is safe"*
- *"To protect yourself and others; you can be aware as you want; that doesn't make you ethical"*
- *"It taught me that it is important to ask questions if you are unsure about whether you are making an ethics violation"*

- *“Information can empower you; this can help you avoid business as well as legal troubles”*
- *“Got a better understanding about how easy it is to let ethics slip behind and the consequences associated with that slip”*
- *“To prevent any legal disputes/misunderstandings and overall to improve as a professional”*
- *“Awareness is always better than being uninformed; having the tools and information and help procedures will make you a more engaged employee”*

‘To take responsibility for ourselves’, ‘how to conduct ourselves’, ‘being a professional is more than doing a good job’, ‘to ask questions when unsure’, these responses demonstrate an understanding on the part of the students to show initiative, to be alert and proactive for their own benefit and that of others. This attitude of the Millennials of wanting to do the right thing is consistent with what the literature on Millennials in the workplace say - that the Millennials have a high sense of social responsibility and ethics but they just need to be told how they can achieve it.

Many students associated awareness of organizational codes and ethical policies with safeguarding one’s job and reputation. This sentiment of wanting to play it safe is understandable considering the competitive work environment and volatile economic conditions. This line of thinking could also be reflective of the Millennials penchant for following rules and regulations and for gaining the approval of their superiors.

We need to function as aware informed professional because *“Business is constantly changing so you need to constantly know what is happening around you”*. With new modes of working, new technology and new uses of technology, it is all the more imperative for the new millennial professional to know how to act professionally and responsibly. What better cultural resource than an experienced practitioner to provide an understanding of policies associated with current trends? The following comment from the student shows this *““It helps to have someone explain current state; real-life situations/ practices provides a good baseline”*.

“You can be aware as you want; that doesn’t make you ethical”. This statement couldn’t be more practical. Any amount of ethics instruction, situated or otherwise, does not ensure ethical behavior. It is ultimately up to the individual to want to choose to do the right thing.

CHAPTER 6: STUDY LIMITATIONS, CONCLUSION, AND IMPLICATIONS FOR FUTURE RESEARCH

STUDY LIMITATIONS

Since my study was conducted in classes of other instructors, there were some time and logistical constraints that I had to contend with. First, I had no influence on the time of the semester that the study could be done. The study, therefore, was conducted on the days in which the instructors had pre-selected to cover material on professional ethics. Second, the pre-test, intervention, and post-test were all conducted in one session for the supply chain class. This could have resulted in fatigue thereby reducing the response rate for some of the questions. Third, due to shortage of time, students did not get an opportunity to discuss their post-test responses with the practitioner. Fourth, due to the quasi-experimental nature of this study, lack of randomization, and small sample size of the study the results may not be generalizable. Finally, even though there are quasi-experimental designs that do not make use of control groups, having one would have increased the ability to prove the causality of the intervention.

CONCLUSION

This study investigated the merits of using cognitive apprenticeship, a situated ethics instructional model, with millennial business and engineering undergraduate students. Studies show that standalone ethics and disciplinary ethics, the two existing models of ethics instruction, have educational value but do little to show students how the learning can be applied to everyday, routine ethical scenarios that they may encounter

in their place of work. My study demonstrates how situated learning or situated cognition or everyday cognition can be used to address the gap between learning and doing/application; how principles of everyday cognition can be used to prepare students to deal with everyday ethical decisions.

While situated instruction can benefit anyone, it can be especially helpful to millennial students who are poised to begin their careers because they, as studies point out, have the least amount of life experiences. A prior knowledge of the technical and psychological tools that a cultural context can provide (such as people, organization codes, policy documents, quality manuals and other organizational systems and procedures) and how those tools can be used to help in ethical decision making can help young millennial students in generalizing this understanding to any workplace context they may be a part of in the future. This idea in fact was reflected in a student comment when s/he said that it (the situated ethics instruction) acted as a “good baseline”.

Interacting with experienced practitioners also gave the students a practical sense of current ethical issues that employees have to contend with as a result of rapidly changing technology, economic conditions, and work models; again this was reflected in a few of the students’ reflections.

The timing of the instruction can be important. My study was deliberately aimed at graduating seniors. Positioning situated ethics instruction when students are about to

graduate and join the workforce can help students see the relevance of the instruction and therefore, readily make the connection between learning and application.

The quantitative results as well as the qualitative data demonstrate that there is a definite value in situated ethics instruction. The quantitative results showed a marked increase in the post-test responses of the students indicating an increased ability to explain the rationale behind the organizational codes and consequences of non-compliance. The qualitative responses, on the other hand, reflect students' understanding of the need to act in proactive ways by keeping abreast of company policies and procedures and to take initiative and responsibility for one's actions while on the job. These responses are consistent with what academic and industry reports say about the Millennials, that they have a high sense of social responsibility and that they want to do the right thing, they just need to be told how.

In sum, this study aimed to address the knowledge-practice gap that currently exists in business and engineering ethics instruction. The situated everyday ethics instruction could be considered a third instructional model, in addition to the standalone ethics and disciplinary ethics models.

IMPLICATIONS FOR FUTURE RESEARCH

Given the rapidly changing economic and work conditions, this study was an attempt to look at business and engineering undergraduate ethics instruction in new, practical

ways. The results of the study indicate the effectiveness of using situated learning approaches with undergraduate students in everyday workplace ethics instruction. While this study tested students' understanding of ethical terms and concepts at a basic level, future studies could test for more advanced understanding. Also, everyday ethics as it pertains to globalized work environments received cursory attention in my study, this topic could receive greater attention in further research. The role of the class instructor remained unexplored in my study, this is another area worthy of further investigation. Finally, longitudinal studies could empirically test for the application of classroom learning of everyday workplace ethics. Few studies have examined the usefulness of ethics instruction and the extent of the application of classroom learning in workplace contexts.

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Appendix I Supply Chain Pre/Post-test

Your assigned code:

Please respond to the following questions to the best of your ability. Write 'don't know' if you don't know the response to a question/scenario.

1. This is your first week on the job. You want to inform yourself of the organization's standards/expectations of conducting everyday work ethically and responsibly. What might be examples of two of the company's documents you will read/consult? List them.

2. What might be examples of two offices/departments within a company that deal with issues pertaining to ethics?

3. Is there something amiss in the following scenarios; if yes, explain what's wrong and what you would do instead.
 - a. You usually save your work on your unencrypted flash drive because you can access your projects/official work anytime, anywhere.

 - b. You are cleaning your desk and you find papers from a project that you worked on a year ago. You have no use for them anymore; you tear them up and toss them in the trash can

4. The company you work for operates in different parts of the world; all branches of the companies, irrespective of the country they are located in, will be governed by the same set of data privacy rules. True or False – Circle one.

5. You receive an email from a potential supplier who believes that his product will be of use to the company you work for. He thinks talking business over lunch will be a good idea. He suggests a high-end restaurant in town. Your company, incidentally, is interested in the product and has been on the lookout for a supplier. You accept the lunch invitation. Did you do the right thing or did you violate any of your company code of ethics? If yes, identify the code and explain the violation.

6. You are careful not to make inappropriate jokes or discuss office gossip in emails to your close friend and colleague, John, because emails are considered more permanent and formal in nature. You, however, think it is alright to share crude jokes with John via the company's chat tool because chat communications are less informal and not permanent in nature like emails. True or False - Circle one and explain your response.

7. What, in your opinion, is considered an official record?

8. Your team leader (TL), with whom you share a good working relationship and whom you trust completely, walks up to you and tells you that she needs your signature on three forms that pertain to the project that you are currently working on. You immediately sign the forms without reading them and hand them back to your TL. These forms will be filed away in the company's headquarters. Did you do the right thing? Explain.
9. Confidential company information refers to information about the company that is not available to the public. Confidential information could also refer to information that has limited disclosure *within the company* True or False - Circle one. Explain your response
10. List three documents/records that might be considered confidential from a supply chain and purchasing perspective.
11. You meet your friend, who works as an HR professional in another company, for coffee. The conversation steers towards credit cards and credit scores. You had just conducted a credit check on a Bill Morrison, a potential supplier that day and you couldn't help but comment about Bill's terrible credit score. Did you do the right thing? Explain.
12. What do you need to think about before destroying e-documents? List two reasons. What code of ethics does this scenario fall under?
13. Supply chain and purchasing professionals occupy a **fiduciary position** in an organization. What is your understanding of this term?

Appendix II Mechanical Engineering Pre/Post-test

Your assigned code:

Please respond to the following questions to the best of your ability. Leave blank if you don't know the response to a question/scenario.

1. This is your first week on the job. You want to inform yourself of the organization's standards/expectations of conducting everyday work ethically and responsibly. What might be examples of two of the company's documents you will read/consult? List them.

2. What might be examples of two offices/departments within a company that deal with issues pertaining to ethics?

3. Confidential company information refers to information about the company that is not available to the public. Confidential information could also refer to information that has limited disclosure *within the company* True or False - Circle one. Explain your response

4. List three documents/records that might be considered confidential from a mechanical engineering perspective.

5. Some proprietary information is considered confidential. What is your understanding of the word proprietary? Give 2 examples of what might be considered confidential proprietary information.

6. The company you work for operates in different parts of the world; all branches of the companies, irrespective of the country they are located in, will be governed by the same set of data privacy laws. True or False – Circle one.

7. Is there something amiss in the following scenarios; if yes, **1)** explain what is wrong and **2)** identify the area in a company's code of conduct these scenario might fall under
 - a. You usually back-up company data and the reports you work on your personal unencrypted flash drive because you can access your projects/official work anytime, anywhere.

 - b. You were in charge of developing engineering design software for Company A. Because you developed the software, you decide to save a copy of this software onto your personal computer. After about a year you decide to join another company. The new company too tasks you with developing a software which is similar to the one you developed for Company A. For the sake of efficiency, you decide to adapt the software you developed for Company A to suit Company B's needs.

8. What, in your opinion, is considered an official record?

9. Explain the following terms with an example.

Patent:

Copyright:

Intellectual Property:

Trademark:

10. You are careful not to make inappropriate jokes or discuss office gossip in emails to your close friend and colleague, John, because emails are considered more permanent and formal in nature. You, however, think it is alright to share crude jokes with John via the company's chat tool because chat communications are less informal and not permanent in nature like emails. True or False - Circle one and explain your response.

11. Records management is an area that features prominently in many companies' code of ethics? What do you understand by this code? Explain the rationale behind this code?

12. Your uncle has recently started a firm that provides consultancy services to small, upstart engineering companies. He knows that you work as an engineer in Company X and thinks that you could be of great value to his firm. He would like you to work with him on the weekends writing reports etc. You think it's a great way to gain additional experience and earn some extra cash. You accept his offer. By accepting your uncle's offer, will you be violating any of company X's code of ethics? If yes, identify the code and explain the violation.

13. You are a manufacturing engineer. You occasionally work with Duncan, a vendor, who supplies parts and equipment to the company you work for. You discover that Duncan is a member of the upmarket Cherry Orchard Country Club. You've heard about the superior facilities the club offers. Duncan thinks that he can arrange for you to use the club for a week as a guest. You are thrilled and accept his offer. By accepting Duncan's offer, will you be violating any of your company's code of ethics? If yes, identify the code and explain the violation.

14. You are an environmental engineer. The company you work for regularly releases water effluents into the local lake, a flourishing tourist spot. As part of your job you monitor these discharges and submit a periodic report to the Department of Natural Resources. Your current report reveals that the discharges slightly exceed the legal limits. There is no reason to believe, however, that this will pose any danger to the tourists or locals. Your supervisor tells you that the excess is merely a 'technicality' and asks you to adjust the numbers so that the company appears to be in compliance. She also tells you that it will cost \$200,000 to fix the problem and the bad publicity will scare tourists away. What will you do?

15. You share a great working relationship with Linda and Jen, your colleagues at work. You find that at team meetings your supervisor, Mike, often discounts the contributions of Jen and Linda. You find this unfair and unethical. How might you address this chauvinistic attitude of your supervisor?

Appendix IV Participant Information

Your assigned code:

1. Your major:

2. Year in college (junior/senior/other):

3. Have you worked as a full-time employee before? Yes / No (circle appropriate response)

If yes,

a. For how long?

b. In what area/department?

c. What was your job title?

4. Have you interned before? Yes / No (circle appropriate response)

If yes,

a. How many times?

b. In what area/department?

c. What were your key responsibilities?

Appendix V Supply Chain Rubric

	Points	Evaluation Descriptor
Q 1	2	Company's code of ethics or code of conduct or company policies/laws Department policies (e.g. Accounting, Purchasing) Employee handbook Resources on company's website Safety/security/quality standards or manuals Standard operating procedures Accounting policies/standards
Q 2	2	Human Resources (HR) Legal or legal and compliance or legal standards Management Procurement/sales department
Q 3a	2	Yes, violates data privacy/information security code Anyone can access and misuse information from an unencrypted flash drive
Q 3b	2	Yes, violates data privacy/information security code; destroy document securely (shred) after checking record retention policies The project can fall in the wrong hands and information can be misused
Q 4	1	False
Q 5	3	Yes, violates conflict of interest code; Supplier/vendor is paying for my lunch at an expensive restaurant – can amount to bribery – the situation has the potential to influence my professional decisions; can prevent me from making unbiased/impartial decisions
Q 6	2	When you are using the company's communication systems, you must conduct yourself in a way that complies with the law and the company's policies - electronic communications policy/code

Q 7	1	Any recorded information in any media or format, which documents business activities or transactions and is retained for a specified time period to comply with legal, financial, business or archival needs of the company.
Q 8	2	Must always read before signing official records/forms. You are responsible for anything that you sign; it can adversely affect you/company
Q 9	2	True; work-related information must be shared with fellow employees on a need to know basis only
Q 10	3	Pricing order/details Supplier details Vendor contracts Suppliers/ proprietary info/details Future product plans Supplier analysis Invoices
Q 11	2	No; violated the confidentiality code, client/vendor details are confidential
Q 12	3	Does it have any legal holds? Has it exceeded the records retention period / out of date? Do you still need the information? Is it an official record Concerns records/data management policy/code
Q 13	1	Fiduciary position means a position that involves trust; supply chain professionals handle company's money and resources / if you are spending on behalf of the company

Appendix VI Mechanical Engineering Rubric

	Points	Evaluation Descriptor
Q 1	2	Company's code of ethics or code of conduct or company policies/laws Department policies/ HR policies Employee handbook Resources on company's website Quality manual Safety manual Intellectual Property documents
Q 2	2	Human Resources (HR) Legal or legal and compliance or legal standards
Q 3	2	True Confidential information should be shared on a need to know basis only
Q 4	3	Design documents (ex. CAD models etc.) Coding documents System and procedure manuals Production specifications Test results Project-related emails
Q 5	3	That which belongs/pertains to a company Changes in organizational structure/leadership Financial information Changes in business structure/processes Computer software, technology, business/manufacturing methods and processes Databases
Q 6	1	False

Q 7a	2	Yes, violates data privacy and confidentiality/electronic communication code Anyone can access and misuse information from an unencrypted flash drive
Q 7b	2	Any work you develop/produce for a company belongs to that company – proprietary information. Confidential information must be protected during and after one's employment in a company Violates data privacy and confidentiality code/intellectual property laws/records management and information security code
Q 8	1	Any recorded information in any media or format, which documents business activities or transactions and is retained for a specified time period to comply with legal, financial, business or archival needs of the company.
Q 9a	2	Patent: Protects methods, the structure, and the functionality of products. Also, a "new use of a known process, machine, manufacture, composition of matter, or material." e.g. Machines and parts of machines, products produced by machines, alloys, drugs, chemical compounds, mixtures
Q 9b	2	Copyright: protect expression of creative ideas / the manner in which ideas and facts are expressed Original works of authorship fixed in any tangible medium of expression, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. e.g. Songs, artwork, writing, films, software, video games etc.
Q 9c	2	Intellectual Property: The owner of an IP acquires exclusive rights and can file a lawsuit to stop others who use the property without authorization. E.g. Patents, copyrights, trademark, and trade secrets are types of IP.
Q 9d	2	Trademark: Protects marketing signifiers; A trademark is defined as any "word, name, symbol, or device or any combination thereof adopted and used by a manufacturer or merchant to identify and distinguish his goods. e.g. brand names, names of a product or service, symbols, logos, shapes, sounds, smells
Q 10	2	False; When you are communicating about the company you work for or are using the company's communication systems, you must conduct yourself in a way that complies with the law and the company's policies All e-devices must be used for professional/business communication purposes only. The company can still retrieve chat records Falls under the electronic communications policy of a company

Q 11	2	<p>Records Management Policy and records retention schedules describe what records to keep and for how long.</p> <p>These policies exist so that records are saved and retrieved in ways that adhere to a company's data privacy and confidentiality policy</p> <p>Records also need to be saved/archived should it need to be used for government/legal/arbitration purposes</p>
Q 12	3	<p>Yes ; Code violated conflict of interest - A conflict of interest may exist when your personal situation could get in the way of your ability to perform your job in an unbiased and impartial manner and in a way that best benefits the company</p> <p>You could use information/practices of one company to benefit another company or yourself.</p>
Q 13	3	<p>Code violated conflict of interest; accepting gifts, bribery</p> <p>Avoid favoring a client/vendor; you might have to oblige a vendor by buying sub-standard products from him/her or you may have to buy/source products at a higher cost.</p>
Q 14	1	<p>Whistleblowing; inform a higher authority</p> <p>Always follow rules and procedures</p>
Q 15	1	<p>Gender discrimination; Talk to supervisor; talk to HR, discuss with female colleagues</p>

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Curriculum Vitae

EDUCATION

- **Multidisciplinary PhD in Learning & Development and Technical Writing**, University of Wisconsin-Milwaukee, 2015

CONFERENCE PRESENTATIONS

- **The Promise of Self-Directed Learning Pedagogical Practices in Shaping the Millennial Professional.** Association for Business Communication (ABC), Midwest Region Conference, Minneapolis, MN. April 2014.
- **Object-Oriented Instructional Design.** ABC, Southeast Region Conference on Technology Trends in Teaching & Communication, Orlando, FL. March 2014.
- **Self-Assessment as a Learning Strategy.** University of Wisconsin- Milwaukee and Marquette University First-Year Graduate Student Conference, Milwaukee, WI. December 2010.