

Implementing the Required Ethics Component in Engineering Classrooms

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Abstract

This document focuses on how ethics education, more globally referred to as character education, is being implemented into an undergraduate college program. Very successful techniques are discussed that have been proven useful in providing instruction to future professionals in national character education curriculums involving morals, values and ethics. Suggestions for integrating character education into the engineering ethics requirement are highlighted.

Engineering programs across the nation are investigating techniques to implement the ABET accreditation requirements (Engineering Criteria 2000) regarding ethics instruction for engineers. According to Criterion 3 of ABET's Engineering Criteria 2000, "engineering programs must demonstrate that their graduates have . . . an understanding of professional and ethical responsibility" (Engineering, 1997).

Many practitioners agree with the concept identified by Whitbeck's (2004, Undergraduate Education in Practical Ethics) that "rather than simply studying a code, a more engaging active learning approach" is needed. This new emphasis in ethics education is not limited to the engineering profession alone. In fact, this is a component of a much more global movement entitled Character Education. Character Education's roots lie in behavioral ethics, and can be viewed as an understanding of desirable and undesirable actions based on a society's perceptions and norms.

Sample topics that should be considered for an engineering ethics curriculum includes appropriate behavior (Whitbeck, 2004) related to: recruitment; employment; termination; guidelines for raising ethical concerns; commission payment under a marketing agreement; gifts to foreign officials; and writing a letter of recommendation. Discussions on these types of topics will allow each student to consider appropriate actions and desirable professional behavior. Once an individual understands and perceives society's distinctions between positive and negative actions, character education then enables the individual to internalize these values. As a result, the individual develops a personal code of professional conduct, which then guides their daily interactions.

According to Pfatteicher's article published in the Journal of Engineering Education (2001), "few engineering faculty object, in principle, to these changes, but many struggle with the practical question of just how to instill this understanding of ethics in their graduates." The "Online Ethics Center for Engineering and Science" promotes addressing ethics education in an ongoing and proactive manner: "The active learning exercise should be chosen so that, over the course of their undergraduate career, students engage in developing a full range of ethical skills.

Ethics and character education is becoming a component in many professional curriculums across the nation. Some engineering programs are electing to teach specific courses related to this topic, while other programs are investigating techniques to implement this ABET accreditation requirements into existing courses. "This is not to say that required courses in engineering ethics have become norm" comments Herkert (2002) from the National Academy of Engineering in his article Continuing and Emerging Issues in Engineering Ethics Education. According to a 1999 study, "nearly 70 percent of ABET-accredited institutions have no ethics related course requirement for all engineering students. Although 17 percent of institutions have one or more required courses with ethics-related content".

A significant percentage of these programs report they are unsure of the specific methodology to utilize in adequately addressing this component in their programs. This manuscript focuses on how ethics instruction is being implemented into undergraduate college programs via preservice seminars. These preservice seminars are specialized sessions that young professionals must attend before actually entering the working world.

Regardless of which methods you select, the ideas, concepts, and techniques presented are intended to assist all engineering faculty as they strive to comply with the ABET standard by which they will eventually be evaluated. Although not an undergraduate engineering program, this case study does provide excellent examples of methods and techniques that can be used by engineering faculty.

Character without knowledge is weak and feeble, but knowledge without character is dangerous and a potential menace to society. Character and knowledge together are the twin goals of true education.
Boston Latin Grammar School, 17th century

Introduction

Present society places many demands upon classroom teachers. They are expected to deliver all areas of curriculum with mastery and ease. They are forever being called upon to incorporate one more essential piece needed for full student development. Ethics and Character Education has become one of these new essential pieces. All teachers, no matter what their grade level, discipline, or years of experience, need information and guidance on how to demonstrate and implement positive character traits in the classroom.

Experts agree that the best way to train individuals in character education is to reach them before they graduate and enter a profession. Therefore, undergraduate departments need to begin incorporating Ethics and Character Education into their curriculums. A survey conducted by the Boston University Center for the Advancement of Ethics and Character (1999) demonstrated that over 90% of the deans and directors of teacher education across the country supported the teaching of core values in schools. Yet over 81% reported being unable to adequately address Character Education in their own teacher preparation programs (Ryan & Bohlin, 2000). Clearly this is a call to initiate and deliver components of Ethics and Character Education in all undergraduate curriculums. This paper will address one institution's initial response to this call and how an Ethics and Character Education thread began to be incorporated into its undergraduate curriculum.

The Call for Ethics Education for American Professionals

Historically, Dewey believed that moral education could not be divorced from the school curriculum. Rather, it should be delivered through all of the “agencies, instrumentalities, and materials of school life” (Dewey, 1909). Ryan (1996) suggested that the morals, values and ethics we want students to learn should be identified by adults and taught by matching the topic and level of intensity to the students' developmental level. Direct teaching of these pre-selected morals aims at the transmission, acquisition and exercise of what are seen as the accepted moral values of the culture (such as honesty, and responsibility), and emphasizes the principles of learning and social learning theory (Solomon, Watson, & Battistich, 2000).

This pedagogical view and recent tragedies such as the Columbine, Heritage, and Santee school shootings have impelled school boards and administrators to view Ethics and Character Education as a way to counteract and prevent violence. The result has been the development and implementation of Character Education programs in public schools across the nation. Federal monies from the U.S. Department of Education have been available to school districts since 1995 to support the development of pilot character programs. As of May 1999, nine states have initiated such projects. In Virginia, Georgia, Florida, and Mississippi legislation has been passed mandating that Character Education programs be implemented statewide. As a result, teacher education programs are now being called on to provide a basic framework of Ethics and Character Education to preservice teachers. Greer (1998) believes that matters will certainly grow worse if the schools of education-and their colleagues in the liberal arts colleges-do not prepare the nation's future teachers to teach effectively about morals and character.

Developing an Ethics Education Component

In the fall of 1998, discussions began in our traditional four-year teacher preparatory program on how to introduce our future professionals to the concepts of morals, values, and ethics. We wanted them to clarify for themselves where they personally stood on these issues. In addition, the young professionals needed to investigate the perspective of being the classroom teacher transmitting these pieces to their students. Discussions

revolved around the notion of teachers being ‘centered’ and ‘teaching from the heart’ as being the best grounding for productive teaching.

Our vision of ‘centered’ teachers is derived from Hargreaves’ (1994) idea of the boundless self, where an individual is able to dynamically respond to the changing environment through a continually reflexive stance (Texas A&M University, 1995). Thus the individual is always open and able to honestly embrace whatever may come next. ‘Teaching from the heart’ comes from Parker Palmer’s (1998) discussion of what makes a good teacher. He defines a good teacher as one who can weave connections between oneself, the subject, and the students. These connections are held not in the teachers’ methods but rather in their hearts – meaning heart in its ancient sense, as the place where intellect, emotion, spirit, and will converge in the human self (Palmer, 1998).

Through these discussions we, as an education department, began to clarify not only how we view a “teacher” but also what we believe future professionals need to come to terms with in relation to Ethics and Character Education. We wanted them to begin investigating the morals, ethics, and values that support their sense of personal self, understand how these terms are presently being defined, and be introduced to possible strategies for incorporating Ethics and Character Education into classroom teaching.

As a result of on-going discussions and the inability to add Ethics and Character Education into an already crammed curriculum, the education department decided to begin implementing these elements through a Character Education Seminar. In the fall of 1998, the department conducted a survey with all junior education majors on morals, values, and ethics. The survey sought to understand where students stood on these issues and identify the needs as related to their concerns about character education. Survey questions included: is moral formation of conscience an important aspect of education?; should values be taught in school?; which values or whose should we teach?; and what is a caring community of learners? Results indicated that the education majors strongly believed that the teacher is a primary avenue for delivering the values of the society, aiding in the formation of the individual conscience, and responsible for providing a classroom atmosphere of safety and belonging.

Based upon this feedback, a seminar was crafted that would serve as an introduction to Ethics and Character Education. This first seminar was offered in the spring of 1999. Junior and senior education majors were invited to a one-day, nine to four, workshop on Ethics and Character Education. The day, chosen many months previously, was ironically the Saturday after the Columbine killings. The seminar group reeled under the enormity of what had taken place and helped cement our mission for the day. We began with a moment of silence dedicated to the students, teachers and administrators, families and the community of Columbine.

The seminar was divided into several blocks of time encompassing different approaches and outcomes. The first block of time focused on reflection and discussion of personal morals and values. The discussions centered upon the basic values of trustworthiness,

responsibility, caring, and respect. Faculty and students discussed how these are developed individually and how they guide their life. Student teams then investigated how abiding these values are through moral dilemma exercises where the decision to do what is 'right' versus the pressure of the group played out.

Another block of time was devoted to the delivery of overviews on pre-developed Ethics and Character Education curriculums, including the Character Counts! Coalition (1993), the Child Development Project (1981), and the Positive Action Model (1998). In addition, a presentation of a senior research paper on Character Education highlighted the national call for educators to address this arena in classrooms.

Students were actually relieved to be able to openly discuss these issues and garner responses to thoughts and questions from peers and faculty. They left that day feeling refreshed by the honesty in their own personal evaluation of morals, values, and ethics. Students also felt energized by having taken this first step in understanding the role of Ethics and Character Education in today's public school classrooms.

Due to this positive student response a second Ethics and Character Education seminar was developed and implemented in the spring of 2000. Again junior and senior education majors were invited to attend a one-day seminar. The format remained basically the same except for the addition of a student-team presentation. Two senior education majors, who had attended the 1999 workshop, requested an opportunity to participate in the 2000 session.

These two education majors inspired and dedicated to what they had seen and heard in the 1999 seminar asked permission from their school administration to implement the 'I Care' Character Education (1997) curriculum into their student teaching classrooms. Permission was granted and the program was implemented with such success in their classrooms that the principal asked them to present the curriculum to the entire school faculty. The following spring the 'I Care' program was successfully adopted school-wide and continues to be used today. During the 2000 seminar, these two students told the story of what had happened and presented an overview of the 'I Care' curriculum with actual lesson plans and activities. The education majors not only left this seminar feeling refreshed and energized but now they also felt empowered. They could make real differences in classrooms with students.

The department has presently completed its third Ethics and Character Education seminar. Some of the basic components of that first seminar remain. Students were engaged in various blocks of time including, reflection and discussion of personal morals and values, moral dilemma exercises, and delivery of overviews on pre-developed Ethics and Character Education curriculums. In addition, teams of senior education majors presented the various character education curriculums being used in the districts in which they taught and where the juniors will student-teach. Juniors attending were excited and relieved to be able to overview the Ethics and Character Education curriculums and ask questions of the seniors. It is hoped that through these presentations our juniors will enter

their assigned student-teaching placements and our graduates their first teaching position with a great deal of understanding and confidence in this school required curriculum area.

In addition to maintaining the seminar format, the department has implemented building blocks of Ethics and Character Education into existing course work. For example, students enrolled in the required Children's Literature course develop a mini-unit utilizing literature to teach basic precepts of character such as: friendship, responsibility, trustworthiness, and respect. In the social studies course, students study civic ideals and practices of citizenship. These course activities offer valuable introductions and application opportunities in which students begin to identify Ethics and Character Education components within the major content areas of the traditional K-8 curriculum.

The Ethics and Character Education seminar remains the capstone experience where students benefit from immersion in pre-constructed local, state, and national programs. Offered to the junior and senior education majors, these upper division students bring an understanding of classroom curriculum and operation that provides a basis to view how these ethic and character education programs can seamlessly dovetail into any K-8 setting. The supportive, peer environment of the seminar encourages open, honest, and critical dialogue enabling these young professionals to inquire, evaluate and apply principles and programs of Ethics and Character Education to the work environment.

Application Example of Internalizing Ethics in Engineering

In Pfatteicher's article that appeared in the January 2001 edition of the Journal of Engineering Education, excellent examples of this implementation were offered that enabled engineering students to strength and clarify their own beliefs. In one illustration, students were provided a copy of the NSPE Code of Ethics and sample case studies. Groups of students were challenged to apply the code to the cases. The groups then compared their results, leading to interesting class discussions which identified different perspectives on the issues. After which, the class's conclusions were compared to the findings of the NSPE Board of Ethical and Professional Responsibility for the actual cases. This approach leads students to consider the value that engineering ethics has to the profession and the value that character education can have to individuals.

Conclusion

Ethics and Character Education is becoming a component in many professional curriculums across the nation. Some engineering programs are electing to teach specific courses related to this topic, while other programs are investigating techniques to implement this ABET accreditation requirement into existing courses. In a response to the Case Western Reserve University's ABET readiness committee, Whitbeck (2004) summarizes the objective:

“The responsibilities of adults as citizens, community members, and professionals are complex and demanding. University education should

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enable students to integrate ethical understanding of these complex responsibilities with the advanced knowledge that they will draw on in deciding how best to meet those responsibilities.”

Regardless of which method you select, the ideas, concepts, methods and techniques presented in this document are intended to assist engineering faculty as they strive to comply with the recent ABET standard by which they will eventually be evaluated.

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