ABSTRACT
In this paper we address the problem of introducing computer ethics to students. We believe that students need to be taught about ethics perhaps as early as elementary school when they are beginning to use computers.

KEYWORDS
Computer ethics, K-12, appropriate use

1. INTRODUCTION
Computer ethics is a topic of growing interest to many of us on college and university campuses. As Internet Postmaster and Computer Security Incident Coordinator at Rensselaer Polytechnic Institute (RPI), I speak with every student who has violated some aspect of our Electronic Citizenship policy (http://www.rpi.edu/web/comec). I also receive complaints from our students who have been victims of harassment, SPAM, and e-mail forgeries as well as a myriad of other complaints from their friends on other college campuses or from their high school days.

2. BACKGROUND
When the students arrive on our campus, they are informed of the acceptable use policies, sign a document of agreement and are referred to the complete Electronic Citizenship document (COMEC) on our web site. For many of them, this is too late.

A chance conversation with my nine year old nephew, who knew more about how to use my computer at home than I did but knew nothing about appropriate etiquette or behavior using a computer, convinced me that teaching computer ethics to college students occurs too late in their computing experience. It is my belief that a more opportune time to teach students about ethical computing would be when they are younger, at the elementary school level, since it is then that most of today’s students learn how to use a computer. By the time students arrive at college too many bad habits have formed.

Academic Computing Services (a department within Computing and Information Services) at RPI currently has a proposal before our Information Technology (IT) degree program for the production of a multi-media program with an intended audience of elementary school students for the purpose of teaching computer ethics in a format with which young students are familiar. The production would be designed and produced by a senior in our IT program who has chosen Electronic Arts as a minor, and at least one ethics course as an elective.

The IT undergraduate curriculum is designed for technically focused students and those having substantial technical aptitude but other interests as well. It synthesizes computing, systems and humanities and extends the student’s horizons from the focused core of IT to the disciplinary knowledge of a student-chosen second discipline.

The Electronic Arts program is a Bachelor of Science Degree program in Electronic Media, Arts, and Communication and is offered jointly by the Department of Language, Literature, and Communication and the Arts Department at Rensselaer. It provides students with the multidisciplinary education necessary for leadership in a rapidly transforming information society. It seeks to integrate aesthetic, creative, and critical thought with expertise in advanced electronic multimedia. Building on the strong technological infrastructure of Rensselaer, this pioneering program offers students hands-on education in new art and communication technologies as well as a theoretical framework for understanding and eventually shaping the cultural impact of these technologies. [1]

It is a degree completion requirement of the IT program to have a “Capstone” (the high point, crowning achievement) [2] project. The Capstone project, required for all students graduating with a Bachelor’s degree in IT, acquaints students with all phases of an IT development project from recognizing the need through project implementation. Ideally, it is multidisciplinary and writing-intensive.
3. TALKING WITH KIDS

We are all aware that children are being introduced to computing at an early age. Computer games and educational software are geared to children as young as 18 months. By the time these children reach elementary school, it is very likely there will be a computer available for their use.

New York State has the country’s largest educational system, with more than a million students in 1,100 schools. Of those, 674 schools and 3,157 classrooms are connected to the Internet, said Elspeth Taylor (2/26/98), chief information officer for New York City’s board of education. Nationally, 78 percent of the 80,000 public schools were linked to the Internet in 1997, but just 27 percent of classrooms were wired, according to a survey by the New York State Department of Education. [3] This figure was 89 percent in 1998. About 51 percent of instructional rooms had access to the Internet in 1998. [4]

I interviewed 41 10-13 year olds attending RPI’s “All Sports Summer Camp,” one of the many summer programs offered by the University. All children are eligible to attend. Some are children of faculty and staff and the other children are from the City of Troy, N.Y., where RPI is located and the surrounding communities that have no connection with RPI. The students attend public schools, parochial schools and private military academies and the number of boys to girls was fairly evenly divided. In order to gain their confidence and encourage their honesty, I made it clear that the answers to my questions wouldn’t be reported back to their parents, that they would be helping me with a research project and that I would be happy to answer any of their questions at the end of my questions. This lunchtime conversation is not intended to be a scientific study, but given the differences among the children of this group in terms of grade in school, public, parochial, or military school and the answers common across the group, the answers should be fairly typical.

Below are my questions (in italics) and a summary of the responses.

- **How many of you have used computers in school or at home?**
  
  Almost every hand was raised.

- **Did you have a class where you were taught how to use the computer?**
  
  Only about one-quarter of the students present had a formal computer class in school. The rest learned how to use a computer from their parents or friends.

- **Does anyone know what the word “ethics” means?**
  
  Only one student tried to answer the question about what the word “ethics” meant.

- **Did your computer teacher talk to you about computer ethics?**
  
  No students were taught about ethics, though most admitted to having been cautioned about chat rooms.

- **Does anyone know what the word “copyright” means?**
  
  Most of the students knew what copyright meant; only about two of the students said they wouldn’t violate a copyright.

- **Can you give me some examples of what might be copyrighted?**
  
  Most of the students only thought music was copyrighted. No one mentioned photography or art.

- **Have any of you copied something from the Internet and turned it in for a homework assignment?**
  
  Fully half of the students had copied information from the Internet in its entirety and handed it in as homework.

- **Did you know it was wrong? Why did you do it?**
  
  All the students who answered knew it was wrong; as to why they did it, their answers ranged from, “I’m lazy,” to variations of, “My teacher wouldn’t find out because s/he doesn’t use computers.”

- **What about MP3s? Napster?**
  
  Most of them thought it was ok to violate copyright because, “Companies already make enough money.” Interestingly they were fairly evenly split as to whether Napster was ok.

- **Have any of you copied computer games that a friend bought? Is that ok?**
  
  They believe that it is ok to copy games their friends buy since they aren’t planning to sell the game to other friends. Their thought is that it is ok to violate a copyright since they aren’t going to be making any money from the violation.

- **How would you pay back someone who sent you a bad message?**
  
  All but one of the students said they would send the person a nasty message back and either not use their real name or use the name of someone else they didn’t like. Only one student said he would, “Just delete the message.”

- **If you had to participate in a program about learning how to be a responsible computer user, what format would you like to see? Video? Video game? Cartoon?**
  
  The students were divided about how they would most like to learn about ethical computing behavior (including one student who didn’t want to learn about it at all). Some suggested a teacher telling them; some thought a cartoon; some thought a video or a video game.

It is interesting to me that although the students had been cautioned about chat rooms, the same students who raised their hands that they had been cautioned about them admitted to using them anyway. When I asked them, “Why use them when you know it could be dangerous?” they all replied something along the line, “Because it’s fun.”
In my conversations with undergraduates who have violated some aspect of our conditions of use agreement, their philosophies and indeed, their use of the same words, as these 10-13 year olds were virtually the same. So opinions formed at a relatively young age (5th through 8th grades) don’t change as they mature and progress through high school.

It seems imperative to me that we have to do a better job at teaching these young computer users appropriate use. Their teachers don’t seem to be addressing this issue. At least no student (in my admittedly unofficial survey) reported their teacher had taught them about ethical behavior. One student said his teacher expressed disappointment that the students didn’t know how to type!

4. PROPOSAL BEFORE INFORMATION TECHNOLOGY DEPARTMENT
Academic Computing Services (ACS) at RPI currently has a proposal before our IT Degree Program committee for a “Capstone” project to produce a multi-media product for the purpose of teaching middle school students good computing behavior, so that by the time they reach their college years, appropriate behavior will be second nature. We know that we can’t go into someone else’s unlocked house or use someone’s car without his or her permission. These same students know they aren’t supposed to copy someone else’s work while doing a test or quiz but that same sense of morality doesn’t carry over to their computer use. Is it because the “companies already have enough money” or because it is harder to get caught?

The “Capstone” project is a degree completion requirement for the BS in IT.

The project is as follows:

1. Proposed outline, including milestones for the Capstone student to meet and deliverables anticipated, is submitted by Academic Computing Services for review by Capstone project leader. Capstone project leader advertises proposed outline to seniors who are invited to submit ideas for the project.

2. ACS will meet with accepted student(s) to discuss our goal for the project. Our goal is to have the student(s) produce a multi-media product geared toward middle school students for the purpose of teaching them basic concepts of ethical computing behavior. The RPI COMEC document will be the starting point for deciding what information the video or game (though geared for middle school students) should include along with recommendations from other experts as the project progresses.

3. The Capstone student will conduct surveys of local middle school students to ascertain how much the average middle school knows about computer ethics, and design an appropriate multi-media program to appeal to that age group.

4. RPI’s expert faculty in the fields of Artificial Intelligence, Ethics in Complex Systems and other disciplines, already members of the IT faculty, will be called upon for their advice during all stages of the project. Additionally, we will solicit input from experts in the child development area for advice on such issues as how children best learn moral concepts and so on.

5. The Capstone student will be provided whatever technical expertise is necessary to produce the final product.

6. RPI will advertise the availability of the finished product to local school districts for distribution and use.

The advantages to the University in making the final product available to local schools at no cost include enhancement of the “Town-Gown” relationship, potential recruitment of students, and positive public relations for the University.

This project is in its most preliminary stages. I will update SIGUCCS attendees in November with the current status.

5. ACKNOWLEDGMENTS
I wish to especially thank Brian Surace of the RPI All Sports Summer Camp for access to the survey group of students. I also wish to thank my colleagues, Adrienne Birchler, Harriet Borton, Jon Finke, Nancy Kutner and Sharon Roy, for their editing assistance and advice.

6. REFERENCES
[1] RPI Catalog