KIDS IN DANGER℠ **TEST**
Teach Early Safety Testing
Integrating Product Safety Into The Curriculum

Engineering Student Survey
Response from University of Michigan

Kids In Danger (KID) designed the Teach Early Safety Testing (TEST) Program to promote the development of safe products by integrating children's product safety, standards and testing practices into the undergraduate engineering curriculum. To evaluate current safety education in engineering programs, KID designed a survey instrument. Students in Mechanical Engineering program at the University of Michigan were asked to complete this survey. Forty-six students responded.

Survey Findings

Most of the students (93%) were undergraduate Mechanical Engineering majors, graduating within a year. The rest were pursing a Masters or Ph.D. in Mechanical Engineering.

Design Safety in Classroom Instruction

Two-thirds of the students (67%) said that they had taken classes, forums or seminars in which design safety and potential hazards of products were discussed. The other third said they had not taken any such classes. Sixty-one percent mentioned either ME 250 or ME 350, Design and Manufacturing I and II as their source for safety information. Another 17% mentioned ME 382, Mechanical Behavior of Materials, as a place where safety was discussed. But these optimistic results were a little tempered when asked what was discussed. Most students mentioning a topic mentioned a workshop or manufacturing safety issue (54%) and only 32% said a product safety *design* issue was addressed.

Standards Education in Classroom Instruction

Moving to the specific issue of standards, either mandatory or voluntary, only 28% of the students said classes had addressed this issue. Seventy-two percent could not recall a class that included information on standards. Again, ME 250 and 350 and 450 were mentioned, along with ME 382. Four mentioned classes that are more specific. Most (77%) listed general product safety standards as the topic discussed although some mentioned a specific safety issue (15%) or standard specification (30%)[1].

Student Perceptions of Safety Instruction and Knowledge

Only 30% of students said that classes addressing standards or safety presented them with new knowledge about the topic, 37% they did not garner new safety knowledge and 24% were unsure. But among those who said safety or standards were addressed in their classes, 47% said they learned something new, 25% said they did not and 28% were unsure.

[1] Some sections total more than 100% because students could list more than one class or topic.

So, if some students aren't learning it in class, do they feel they are knowledgeable about design safety? Surprisingly, more than half, 58% say they are very or somewhat well informed about design safety. Twenty-eight percent said they were somewhat uninformed and 13% felt very uninformed. They were much more likely to think their classmates were uniformed. No students felt their classmates were 'very well-informed', 46% thought they were somewhat informed and 40% though they were somewhat uninformed. Again, 13% thought their classmates were very uninformed.

Using Safety Knowledge

Only one third of students, 33% felt confident in their ability to test their designs for safety and risk prevention. Slightly more said they were not confident (37%) and 30% were unsure. Students would like to see more safety information covered in their engineering education. Of the 28 who answered this open ended question, 29% wanted to learn more about standards and testing, 32% wanted to learn more about design safety specifics and 18% wanted to learn more about potential hazards, examples of dangerous products and product liability.

Students believe the importance of standards lies in their safety effect (67%) rather than their conformity role (16%). Seventeen percent thought both roles were equally important.

Interest in Seminar or Course on Children's Product Safety

One-third of students surveyed (33%) said they would be interested in taking a seminar or capstone course addressing safety and standards in the design of children's products. Thirty-seven percent would not be interested and 29% were unsure. Students felt they could learn everything from what is currently done in the industry to how to make cool toys safe in a course about children's product safety. Others felt they could learn the unique safety concerns for children's products, how to implement safety standards into design, how to design for safety ad becoming more aware of what is unsafe for children. Of the 25 who responded, 72% thought they could learn how to make product safer through design while 24% through they would learn about standards and testing.

Implications

While a small sample of engineering students, this survey provides important pointers for KID's TEST program.

- Not enough information on product design safety and hazard avoidance is reaching undergraduate engineering students.
- It appears that overview classes (Design and Manufacturing) are a good place to introduce the basic concepts with more detailed information coming in specific design classes or seminars.
- Students understand the importance standards play in making safe products, but don't necessarily have enough information about standards.
- Using design seminars or projects can build on students' basic knowledge as well as introduce them to the application of standards and hazard analysis.