Students Taking a Systems Approach to Drinking and Driving

Stephany Yerger, Class of 1999
La Salle High School
Milwaukie, Oregon

Alcohol kills five times more people than cocaine, heroin, marijuana and all other illicit drugs combined.

Everyday, people of all ages use or abuse alcohol. The social costs of caring for abusers often prevails over the cost of educating our youth on the issues of drinking and driving and each year hundreds more become addicted, often taking to the road while under the influence. In conjunction with a Religious Studies III Systemic Transformation Action Plan and the 1998 SyM*Bowl competitor, Shanna Prevé, Jon Barbur, and I set out to create a tool for hands-on alcohol education using STELLA.

The Waters Foundation's generous grant to La Salle High School has enabled us, over the past year, to take a System Dynamics class where we use STELLA to study how things change over time. As a part of the second semester, we had the opportunity to study and develop a model for the SyM*Bowl. Unlike the previous classroom tutorials and guided model building, our preparation, research and actual model creation was done independently. Because our Religious Studies group was in the process of founding a Students Against Destructive Decisions (S.A.D.D.) chapter at La Salle, the idea for an interactive, visual simulation depicting how alcohol consumption impairs a driver came to mind. Wrongly assuming that this would be a simple task, we decided to pursue the idea for our SyM*Bowl project.

Like the drug absorption/elimination models that we had studied earlier, we assumed that a format for alcohol oxidation existed in the STELLA world. Indeed, we discovered a model format, but it was based around false data and a misunderstanding of the oxidation process. So, from scratch, we summoned up our model building skills and collectively began a model that has yielded us much more personal satisfaction than we ever expected.

The thought process was complicated, as we all had to agree on one working idea. The hours of research and time spent working together left us with a new definition of the word *teamwork*. We pulled together when it counted, though, and after nearly a month of hard work, the final copy of the paper and model "How Does Alcohol Affect A Driver's Reflex Action Time?" successfully printed.

The simplicity of the model makes its hands-on use easy to understand. Although there are many factors that affect the reaction to drinking alcohol each individual will have, we narrowed it down to gender, body weight, amount of pure alcohol consumed, and time. After the level of intoxication for the virtual person is calculated, we are able to apply the physics portion of the model, which displays how each drink of alcohol slows one’s normal reflex-action time of .75 seconds. Ultimately, we will add how that, in turn, reduces the car’s capacity to stop in the event of a problem.

The day of the SyM*Bowl competition came and went. We received honorable mention for the social significance of our project, but to our disappointment, we did not place. Our inability to make it to the final round of judging stemmed from our relatively small amount of STELLA experience and our model's lack of one key part: the feedback loop. The accuracy of the data

produced by the model, however, was never in question. Looking back, we now understand some of our model building problems and we understand how to change a lot of them.

Over the summer, the Oregon Partnership, a non-profit drug and alcohol prevention organization, and the Oregon Department of Transportation, have awarded the three of us a grant to develop the model so that it addresses a few other key factors: mixed drinks versus pure alcohol; persons who weigh under 100 lbs; driving a motorcycle, riding a bike, or walking; the effect of minute amounts of alcohol; and various sizes and types of vehicles. We plan to keep the model fairly simple because we will be using it to educate high school health classes, as well as younger children; consequently, it needs to be at a level of understanding that doesn't require a STELLA interpreter. Our turnaround time for these adaptations is six months.

During this next semester, we have been asked to use the model to present at meetings before the Governor's Council of Drugs and Alcohol, to lobby for legislation that supports a legal limit lower than .08 blood alcohol concentration, and to continue its use in health classes in our school. Our first experience with presentations of the model to our peers was very recent as we helped to introduce an extended unit on Drugs and Alcohol to the Sophomore Health classes.

The three of us also have the job of recruiting up to four new students from our school who are familiar with the program and whom we believe will honestly be able to implement our ideas. The new students will follow in our footsteps next year when we move on to college, using the grant money to take the new and improved version of the model into local elementary, middle and high schools to help educate kids on the very real dangers of drinking and driving. It is likely these new modelers will further adapt the model, if not build other models, such as the long-term effects of alcohol use on a liver.

The opportunities provided to us have been enormous, and we intend to continue our endeavors to help educate our peers on the dangers of drinking and driving. The knowledge that we have the power to make a difference has allowed us to taste the sweetest of all successes.