Greetings To ADTSEA Members

2009 Kaywood Award Recipient Barbara Brody

Standards Document Released

Strategies for Teaching English Proficiency in Driver Education

Does virtual reality driving simulation training transfer to on-road driving in novice drivers? A pilot study

In-Vehicle Cell Phone Blocking Systems: Implications for Teen Driving Safety

Novice Teen Driver Education and Training Administrative Standards

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Greetings To ADTSEA Members

Chuck Lehning, President

On August 20th of this year I traveled with Dr. Allen Robinson, CEO of ADTSEA, and Connie Sessoms, Southeast Region Board Member, to Salem, Oregon to attend a memorial service to celebrate the life of our fallen comrade, John Harvey. For those of you who did not know Harv, before his death he was serving as Director of Driver and Traffic Safety Education for the State of Oregon. He previously served in leadership roles in the state of Washington and the state of Vermont. He was a long time ADTSEA member and recognized leader in our profession.

As I reflect on the life of John Harvey I would like to share these thoughts with you. My first thought of Harv was that he always seemed to have a smile on his face. He always made you feel that he was so glad to see you. You could readily tell that Harv loved life and how much he loved driver and traffic safety education for young people. He believed strongly in the value of driver and traffic safety education and it was his passion to share this belief with others. Harv didn’t just want it to be good, he wanted it to be the best. When Harv presented at various conferences and workshops you could feel his excitement. He was high energy, full speed ahead.

Here is my challenge to all of us who work with young people in driver and traffic safety education, let us never fail to provide anything but the best for the students we serve. Let the students know how strongly we believe in the value of driver and traffic safety education. Let them feel our passion. As we teach let them feel our energy and excitement. I know that through the years there have been many individuals who are no longer with us that made outstanding contributions to our profession. To their memory let us carry on the great passion that each of them possessed.

I am encouraged by the ideas presented in the development of National Driver Education Standards. I am also realistic enough to know that unless vast amounts of money are provided to bring about many of the standards presented, such as 45 classroom hours and 10 BTW hours, we will continue to work under the standards currently in place. This is where the old coach in me kicks in. We must continually strive for higher standards, not gripe or complain about what we don’t have. With great energy and passion we must strive to make what we do have the very best it can be. This is the challenge for all who work in driver and traffic safety education.

On a personal note I hope this new school year is going well for you. I know that each new year can bring with it new and different challenges.

Barbara Brody’s Remarks Upon Receiving 2009 Kaywood Award

I am honored to have been selected as the 25th recipient of the Dick Kaywood award. I want to thank Pierson Prentice Hall for their continued support for this award. I especially want to thank Jan and John for their introduction. Jan and I have been ADTSEA roommates for many years and I could tell you many stories of the experiences we have shared but you know what they say: “what happens at ADTSEA stays atADTSEA. Although Jan and I can share many things we can never share clothes. The one time when my luggage got lost believe me she was no help at all. Even though we do not see each other often throughout the year I cherish the time we do share.

I am humbled to be here as the 2009 Kaywood selection. To be in the same company with leaders such as Amos Neyhart, Dr. Richard Bishop, Bill Chushman, Dr. Norman Key, and Dr. Robert Marshall, all individuals who many of you, including myself, never had an opportunity to learn from and others like Dr. Frank Kenel, Dr. Gary Bloomfield, Dr. John Palmer, Dr. Terry Kline, Dr. Maurice Dennis, Dr. Allen Robinson. Fred Mottola, Dick Tyson, Dr. Bob Gustafson and John Harvey who many of us, including myself, are students of and have worked with in a variety of situations. Who would have thought this little girl would be standing here this morning.

In 1972, the year I graduated high school, Cissie Gieda was elected the first women president of ADTSEA. In 1983 Dick Kaywood himself wrote in the Journal of Traffic Safety an article entitled “Affirmative Action. He stated that “the women driver educators I know demonstrate great enthusiasm and competence for their instructional assignments” the article further expresses the need to bring more women into the driver education field as teachers and leaders. Women can add a new dimension to driving instruction, just as they have done in many other professions. 22 years after Cissie Gieda was elected president, I was elected; an honor I still treasure today. We are fortunate to have as Past Presidents Sam Houston, Elizabeth Shepard and most recently Carol Harding. I admire all the work Vanessa Wigand from the Virginia Department of Education and researcher Dr. Jean Shope from the University of Michigan have done throughout the years. Last year...
As you all know, the past several months have been very difficult for our country. With all that has been negative, it is necessary to describe the positive results of ADTSEA this past year and to look forward with anticipation to the year ahead of us. Throughout 2009, you have been reading and hearing about the Driver Education National Standards Project. This project began in the fourth quarter of 2008 and was completed in May of 2009. All of the material concerning this project is included stating on page 11 of this Chronicle. It is must reading for everyone.

For the first time, we have widespread agreement on a basic structure for driver education. This is a structure we can build upon and provide quality driver education through public and private providers. Some say that we have gone too far and others say that we have not gone far enough. We certainly could have done more, but there would have been minimal agreement with the results. Standards do not have to be met exactly as written. These standards are a goal we should all strive to achieve.

When asked “How can I improve my driver education program?”, you can answer by providing these standards as a blueprint for the future. If you believe these standards don’t go far enough, then you can exceed these standards recommendations. As you look at who was involved in this project and view the support of the National Highway Traffic Safety Administration (NHTSA), you will see a nationally combined effort to improve the quality of driver education.

Our recent ADTSEA conference in Charlotte, NC was successful beyond all expectations. With all of the state budget problems and travel restrictions, we still registered 270 people at our conference. In the past ten years, there has been only one conference that had higher attendance, which was Honolulu in 2005.

The North Carolina host committee showed southern hospitality at its best. Southeast board member, Connie Sessoms, planned, organized and implemented a complimentary airport shuttle that was more efficient than anything I have ever seen by a host committee. Chuck and Lynn Lehning planned activities for everyone to enjoy that was different than past years. We had great entertainment on Sunday evening and a tremendous outing to the speedway. There were plenty of spouse activities and a banquet we all enjoyed.

Our conference evaluations have been exceptional. The program planners provided content and information that was of interest and value to everyone. Thanks to the division chairs and all presenters for providing such a high quality program.

For the future, we also have exciting plans. The Missouri host committee is planning a great welcome to the Gateway To The West. The Hilton Frontenac Hotel is ten minutes from the airport and the hotel has complimentary shuttle service. The hotel will also provide shuttle service to nearby casinos. Parking at the hotel is complimentary.

Roger Voigt and the division chairs will be planning a program to meet the needs of all attendees. The names and email addresses of the division chairs is on the web page. If you have a program idea or wish to present, please contact them.

To remember our great friend who passed away in August, John Harvey, we will name the Tuesday luncheon the John Harvey Luncheon. Specific plans for this luncheon are still being planned, but it will be in recognition of John and all who have served ADTSEA.

Thanks to Jan Meeker, NSSP has been reinstated for 2010. The NSSP Conference will begin on Friday before the ADTSEA Conference in St. Louis and conclude on Monday. This will give us all an opportunity to interact with our youth and to show NSSP members what ADTSEA is all about. Again, all conference information is on the web page at ADTSEA.org.

Don’t forget the election that will be conducted in March 2010. All regions will be electing a new board member, as well as our three national officers. Election information will be available on our web page by November 1, 2009.

We are also anticipating an updated version of the ADTSEA 2.0 Curriculum by mid year. To help members select additional teaching materials, we will offer products that are developed by our corporate members on the ADTSEA Store. This is currently under development and will be available by the end of 2009.

I encourage you to remain positive during these difficult times and help all of us work together for a better tomorrow.

(from page 2)

It was so great to see those of you who attended the conference in Charlotte. We in Charlotte enjoyed being host to those of you who attended and felt it was a very worthwhile conference. I hope you are already making plans to attend the 2010 conference in St. Louis, Missouri. We need each of you there to make it a truly successful conference.
Introduction

Simple tasks generally require complex learning. Take driving, for example. Making a right-of-way decision at an intersection seems automatic to most drivers, but in fact, this task was preceded by well-planned instruction and practice. This is also true for communicating in English—a routine skill for most of us but one involving the mastery of vocabulary and grammar. In reality, we are all English learners regardless of native language or resident status. Although most of us speak the language fluently we vary in proficiency. Surely, we driver education teachers can admit to instances of misspelling judgment or maneuver. Even our recently elected U.S. president, known for his oratory skills, has slipped in standard American English:

“So I make no apologies,’ he said with a laugh, ‘for being able to talk good.’” (Mosk and Sleve, 2008)

We are also teachers of English regardless of our primary professional roles and responsibilities. While instructing driver education, we will encounter about 10 percent of students who are learning English as a new language (NCELA, 2006). These intelligent students are eager and ready to learn driving and traffic safety, but at the same time, they must further develop communication skills in English.

This paper focuses on strategies and activities teachers can use to help students become more proficient in English while learning driver education. Instruction has to be adapted to students at all proficiency levels. A sample driver education lesson is presented along with specific suggestions for successfully implementing it.

Social and Academic English

Globally, people overcome the complexity of sharing nearly 7,000 living languages. The U.S., alone, comprises more than 300 spoken languages—a reflection of the country’s dynamic complexity (De Boer, 2001). Our diverse society presents challenges to driver education teachers whose students might be learning a new language and culture in addition to the subject matter. Nearly 50% of English language learners are U.S. born while the others immigrated to this country (Federal Interagency Forum on Child and Family Statistics, 2006). They need to acquire both social and academic English to achieve in school. Social English is practiced in everyday conversations and interactions with others. Acquisition takes place over six months to two years and comprises listening, comprehension and speaking skills although this is dependent upon several variables (e.g., age, personality, determination, social contacts, etc.). Academic English, on the other hand, is used for classroom instruction and readings and it requires mastery of listening, speaking, reading, and writing in various content areas. Acquisition takes place over five to seven years and is dependent upon the degree of literacy the student has achieved in his/her primary language as well as the student’s capabilities in learning a language. For instance, older students who have developed literacy in their first language will transfer that knowledge into English more readily than students who are learning both a new language and a new concept concurrently. A key to acquiring academic English is the approach a school uses to foster English literacy skill development (Gonzales, Gerabagi and Lopez-De La Garza, 2000).

English language learners come to school with varying degrees of English acquisition as well as different levels of primary language proficiency. In response, schools can offer bilingual education programs within which instruction is provided in both the primary and second languages. Another approach would be allowing students to acquire English as their second language. The common element to both responses is sheltered instruction during which English learners have dedicated classes in mathematics, sciences and/or social studies while being mainstreamed into other classes such as driver education.

English Proficiency

English proficiency means having a command of American English vocabulary and grammar. Through standardized tests, teachers certified in bilingual education and/or English as a second language assess proficiency levels and report them to the classroom instructors. The number of proficiency levels and their respective labels vary between school systems. For the purpose of this article, we will recognize English language learners at three levels of proficiency: beginning, intermediate and advanced.

Beginning students have little if any social or academic English proficiency. To them, the English sound system is unfamiliar thus they understand little of what is spoken in English. This can be an intimidating experience resulting in student reticence. Within a short time, these students rely on known concepts in their primary language to better acquire the English language. Beginning students can participate in learning activities that involve pointing, drawing, matching, and speaking.
Mickey Johnson was the first woman to receive the Kaywood award. I am fortunate and appreciative that the committee did not wait another 22 years to select their second woman. I have no words to express how I feel at this moment. It is an amazing moment in my life.

I will tell you, though; I remember an ADTSEA conference in Spokane, Washington which I attended in 1987 when Dr. Bloomfield gave a speech as President of ADTSEA that inspired me to become actively involved with ADTSEA and traffic safety. I felt it could not get any better. Then at the Banquet Amos Neyart who was the Kaywood selection that year spoke. This is the only time I heard and met Amos and what a great treat it was to hear his stories. Amos was 89 at the time. That night I heard how Driver Education got started. Amos was a faculty member at Penn State and in 1933 Amos was visiting his mom for Thanksgiving and parked his car under a light in front of her house. A drunk driver crashed into the rear of Amos’s car. Watching this individual receive medical treatment Amos thought to himself this does not need to be. So he began looking into how people learned to drive and found, not only was there no formal training in how to drive, but no one thought it was necessary for training to happen for something as easy as driving a car. This led Amos to develop the first text called “Safe Operation of an Automobile”. Amos prepared the first integrated classroom and in-car driver education program in the US. In 1936 he started working for AAA to teach teachers and took a leave from his university position to have secondary schools across the country create a new secondary subject called Driver Education. His colleagues and neighbors thought he was crazy to leave Penn State.

In 1994 I became president of ADTSEA and it was the exact same time Dr. Allen Robinson was appointed as executive director. Now those of you that know Allen and me thought “Oh boy, this will work about as well as trying to mix water and oil together”. Well, to be honest, a few

The first Driver Education course back in 1933 had four objectives listed:

To point out the importance of being in good mental, physical, and emotional condition when driving an automobile.

To make sure the driver possesses sufficient knowledge to keep out of traffic trouble.

To make sure the driver possesses sufficient skill to keep out of traffic trouble.

To develop good driver attitudes.

We should all be grateful to Amos and others along with AAA for their insight and visions back then.

In the 1979-80 school year, the year I began this journey, 79% of public, private, and parochial secondary schools offered Driver Education in our school system. That number today is dramatically lower.

In 1983 Amos suggested that we need to do the following to continue to be a vital part of our education system.

Provide better preparation of driving instructors

Switch from time standard to a performance standard

Private businesses and organizations must get back to a leadership and financial role. The federal and state government can not solve our traffic problems.

Driver Education should not be offered just to get a driver licenses. The license should be just a by-product

We as teachers must raise our level of professionalism

Today we are still working to achieve this. I, as well as many of you, am fortunate to have learned from the colleagues or students of Dick Kaywood, Dick Bishop, and Amos Neyhard. I am here because of them and today I would like to thank some of them personally. Many are former Kaywood Award winners themselves.
The Chronicle for DE Professionals
(from page 5)
times it was. But for most of the time
(even today) Allen and I work more
like the process by which Ben and
Jerry’s Ice Cream is made. You take
the best of different types of
ingredients and mix them together
to make a great flavor. We worked
well together then as well as now.
Many of you may not know this but,
at that time, and for awhile
afterwards, ADTSEA was in financial
trouble. Allen, through his great
fiscal responsibility and dedication,
guided us through this time and
made ADTSEA stronger. Today I
want to personally thank Allen on
behalf of us all for the dedication and
want to personally thank Allen on
behalf of us all for the dedication and
work he has done to guide us
through the good times as well as the
challenging times.

I first moved to Vermont in 1979
to teach Physical Education and
coach. When I arrived I was told that
I also was going to teach Driver
Education and that I needed to
attend the certification classes.
There I learned about Zone Control
and took many workshops and
classes from Fred Mottola. Ironically
Fred was a professor at Southern
CT State College where I did my
undergraduate work but I never took
a traffic safety course there and did
not know Fred until I moved to
Vermont and got involved in
teaching Driver Education myself.
After one year of teaching Traffic
Safety part-time I was hooked and
looked for a fulltime position as a
Driver Education Teacher. The next
year I found one and cut back on
athletic career to concentrate on
traffic safety.

In the early 80’s I had taken
workshops with Joyce Epstein, the
guru in Parent Involvement, and I
realized that the only way Driver
Education could stay strong in the
education community was to have
an active parent involvement
program. I knew about the elements
of parent involvement and had
created a parent program and
booklet but I was no Driver Education
expert. So I contacted Fred and we
met for some time to create a
Partnership booklet for teens,
parents and teacher. Once Fred
developed the book I took that first
edition and gave it to over 400
parents in different schools and did
some research on how parents
viewed the booklet. This became my
master’s degree project.

The book was very successful
and, among other things, we found
that it was very beneficial to have an
avenue where students could have
re-enforcement of the lessons we as
teachers were teaching them. It was
also an avenue for parents to receive
some re-training and in the process
learn to drive more effectively.
Another great side benefit I found
was that parents wrote that the time
with their teen provided them an
opportunity to communicate with
their teen while they were in the
vehicle on areas beyond driving.
Imagine parents and teens
communicating. Today Fred’s
Partnership book is used worldwide
and I still have mandatory parent
involvement in my classes 27 years
later. I still feel strongly that Parent
Involvement in a supervised program
is the key to success in your
community. I cherish my relationship
with Fred and Pat and I appreciate
his willingness to include me in his
various projects and learning
opportunities.

In 1992 I became the Driver
Education consultant for Vermont. It
was there that I learned how to work
with political issues within the
different political parties and
government in general. During my
masters program at Trinity College
in Burlington, VT I learned that
learning could be a wonderful
experience. Up until then learning
was hard because I had
undiagnosed learning disabilities
that caused me to always struggle.

After I received my Masters
degree I wanted to continue my
education in the traffic safety field so,
in 1996, I applied for a doctorate
program in a cohort experience at
the University of MN and State
Cloud State University where Dr.
Palmers was the director of the
Highway Safety Program.

I had met John through ADTSEA
and through working together on
many national initiatives. I got
accepted and moved to MN. I also
was hired as a faculty member in the
College of Education working in the
Highway Safety Center. I loved the
program and working at St. Cloud. I
am blessed to have worked with
great colleagues and members of
the MN driver and traffic safety
association. I especially loved
developing curriculum material and
teaching both at the high school lab
school in Princeton MN and the
classes taught at St. Cloud state. I
am especially proud of the
instructional material we developed
in the Sleep, Teens and Driving
project we did with Hennepin County
Medical Center. It was the first
instructional material for Driver
Education programs that dealt with
drowsy driving and teen sleep issues
in the country. A piece on “Eye on
America” with Dan Rather was
broadcast nationwide. If any of you
are here today from MN please
stand. Thank you for your kindness,
care and dedication to Traffic Safety.
MN will always be my adopted state.

I also learned something even
more valuable. During my first year
in MN I lived with John and Ellen and
their children Silva, Sara and
Joseph. When it was decided I
would live with the Palmers many
members of my family and those
who knew the Palmers and myself
thought: “Wow, this will be
interesting.” You see The Palmers
are very devoted to the Catholic faith
and I am very devoted to the Jewish
faith. The Palmers are very devoted
to the Republican Party and I am an
independent voter involved in an
(continued on page 7 )
Po rch Chops for dinner. As an barbecue and the Palmers wanted dinner. We decided to have a was my turn to cook the Sunday living with the Palmers.

Well, not long after I arrived it was my turn to cook the Sunday dinner. We decided to have a barbecue and the Palmers wanted Pork Chops for dinner. As an observant Jew, I had never cooked pork chops but what the heck. While I was cooking my dad called. He was very observant of the Jewish faith. He wanted to know how I was getting adjusted and what was I doing. Well I could not lie to my dad so I said at the moment I was cooking Pork Chops. I heard a thump and thought he had a heart attack but then I heard in a very loud voice WHAT DID YOU SAY? I said I am cooking pork chops. I am not eating them. I am just cooking them. On another grill I was also cooking Salmon but I did not have a chance to tell him that. Sometime later I also helped John stuff envelopes and campaign literature for a woman named Joanne Benson who was seeking the Republican nomination for governor in MN. But that is another story. Five years later I left MN and we were still politically solid in our different views and still strong in our different religious beliefs.

What I learned more importantly in MN is that people who come from different backgrounds and faiths, who have different approaches to social issues can live together, work together, care about each other and still stay solid in their beliefs without harassing, hurting or being inconsiderate to each other. What I have not learned is why governments, cities, towns and our own communities cannot do the same. I am so thankful for all that John Palmer has done for me in my professional and personal life.

I have spent more time living in Vermont than any other place. Most of my professional career has been developed in Vermont and the New England area. I am proud to be the Vice President of the New England Traffic Safety Association and cherish my long standing involvement in this group. If you are from New England, can you please stand. I could not be here today without the opportunities and learning experiences I received from all of you. Thank you all for your support, connections and the care I feel every day. Lindsay and Marquita, Jim, Cathy, Nancy, Bev, Joe and John: you will always be in my heart. I am grateful to the staff and administration at Peoples Academy in Morrisville VT where I continue to teach Driver and Traffic Safety. It is an amazing place to teach because it has a wonderful dedicated faculty and staff that put students first.

As for you, my ADTSEA family. I have worked with many of you. Together we have served on the board, attended NSSP conferences, worked on committees, attended all sorts of conferences and workshops, and I am here to say thanks to you all. I accept this award with great pride.

However my biggest thanks goes to my family and one other colleague, an amazing friend. First, my dad who would have turned 93 in a few days would have been here today to celebrate with me but he unfortunately became ill in May and passed away. If he was here he would first have corrected any grammar or spelling errors and then would say this speech is way too sappy. I miss my Parents every day because, as former teachers who totaled 75 years of teaching day in and day out, they taught me the value of education and the value of being in the teaching profession. This is for you mom and dad and my siblings Richard, Linda and Jonathan.

I am also so grateful that my Partner of 24 years, Martha Abbott, could be with me today to share in this moment. Martha continues to teach me the importance of commitment to issues and causes. Martha has fought for years in the political arena in areas of economic opportunity, education, equality, health care reform and our environment. Thank you for your unconditional love and support.

Lastly, I need to tell you my life changed tremendously when I took my first Driver Education class in 1979. That class was taught by John Harvey. My introduction today was originally to have the three J's. But as you know John Harvey is very ill and unable to attend this conference. I owe my professional career to John. I consider him part of my family. He not only gave me the opportunity to grow and develop as a teacher but as a leader. He has been with me every step of the way. He encouraged me to run for president of the Vermont Driver and Traffic Safety Association. He encouraged me to develop the parent program, the peer intervention program and, in 1982, he sent me to learn about a brand new program called Project Graduation. I came back to Vermont after the workshop and developed Project Graduation for the State of Vermont. For over 6 years I worked with schools all over New England and presented workshops all over the country on this program and in 1986 I was awarded the outstanding teacher award (wasn't it called Teacher of the Year) from my district and the State of Vermont. This award is given annually to a K-12 teacher. Harv encouraged me to run for the board of directors of ADTSEA and then for president of ADTSEA.

I remember that day well. It was in 1991. I was teaching Driver Education and during my third period block the school secretary took a call and all she heard was the person on the line was the president from Washington DC. She quickly got the principal who announced over the loud speaker that I had an important
call in the office and needed to report immediately to the office. Another person came in to watch my class. I was in great concern as you all would be as I thought something happened to a family member. When I got there the secretary said: “The president of the United States is on the phone for you.” I said “For me? What could that be about?” I could not believe it. So I answered the phone and, yes, it was a president and, yes, he was in Washington DC but it was John Harvey as President of ADTSEA in Washington DC for a meeting who needed to know if I wanted to be on the ADTSEA ballot as president-elect. I looked at all the people in the office and said: “Mister President, thank you for the offer but I need to respectfully decline.” And then John and I spoke for a few minutes and I hung up the phone. The inquiring minds wanted to know so I said it was an opportunity from a president that, at this time in my life, I could not accept. A few years later when John asked again I did accept the challenge. John would always be the first person to come up and hug me and tell me how proud he was after I did a presentation. Then later on that evening he would meet with me again and sit down and give me some pointers on how I could do even better. His endless energy, dedication and encouraging ways just made you want to continue on to a higher level reaching for a higher goal.

John when you see this video know that everyone here is thinking of you, praying for you and missing you. I am here tonight as the 2009 Kaywood award winner because of you. I am here because you saw something in me as you have done for so many others and highlighted my weaknesses so I could become a teacher and a leader in Traffic Safety. “You are, truly, the wind beneath my sail.”

This is an exciting time for Driver Education. In February I along with many others here attended a meeting on the National Standards project. Stakeholders from all areas were in attendance and we worked hard to help edit these standards. ADTSEA members including Dr. Robinson, David Huff and John Harvey were part of the committee to develop this work. The results of this work will be presented on Wednesday morning at the secondary division. Jim Wright from NHTSA will also be presenting the Highway Safety Program Guidelines that were published in March as part of the Highway Safety Act. Both documents are a great step forward.

Dr. Kaywood’s greatest love was working with teachers and preparing them to be Driver Educators. Honoring teachers is so very important and valuable in our profession. I am so thankful to AAA for its continued sponsorship of the Teacher Excellence award program that was created during my ADTSEA presidency. Congratulations to everyone who will be honored next. For it is you, the teacher, that makes the difference in the lives of our students.

(continue on page 19)
INTRODUCTION

Automobile crashes are the leading cause of death for teens in the United States. This appears to be a global phenomenon as other countries report similar statistics. Vehicle crashes are significantly higher among young drivers during the first year of licensure, and crash risks decline with increased experience. However, the more newly licensed teenagers drive, the greater their risk exposure. This produces an interesting dilemma about how to provide young drivers with driving experience without significantly increasing their crash risk (Simons-Morton, Hartos, 2003). Driving simulation may be the solution to this dilemma, since exposure to hazardous driving conditions can be simulated in a controlled and repetitive way without endangering the lives of the driver or those on the road with them. Driving simulators can provide novice teen drivers with experiential learning in typical teen crash scenarios which would be difficult, if not impossible, to rehearse in the real world precisely because of their inherent danger.

Research indicates that transfer of training from simulated environments to the real world is maximized when training is characterized by a high degree of both physical and psychological fidelity. While training of novice drivers on a single monitor desk top low fidelity simulator was not associated with fewer collisions, Allen, Park, Cook and Fiorentino (2007) reported that training on a high fidelity driving simulator was associated with $2/3^{rd}$ fewer collisions in the first two years of independent driving compared to the general teen age population. Though there is some research suggesting that both physical and psychological fidelity are prerequisites; the presence of both does not necessarily guarantee effective transfer of training (Hays, & Singer, 1989; Waller, Hunt, & Knapp, 1998). There is a Dutch report documenting that high fidelity VRDT performance by novice drivers does correlate with on-road driving evaluations (de Wintera et al., 2009). A recent Canadian controlled study demonstrated that driving simulation training improved specific on-road driving parameters of senior drivers (Lavallière, Laurendeau, Tremblay, Simoneau & Teasdale, 2009). However, to date there are no published experimental studies of the benefits of VRDT for novice drivers.

The purpose of this study was to investigate whether training of novice drivers on a high fidelity virtual reality simulator transfers to on-road driving performance in a randomized, blinded, controlled study.

MATERIALS AND METHODS

Participants: All participants were recruited at the local Department of Motor Vehicles (Charlottesville, VA), at the time when they had passed their driver education test and had received their learners permit. Parents and teenagers were approached, informed about the study, and, if interested, were e-mailed a consent form to review. During a subsequent telephone call, the IRB-approved consent form was reviewed. The consent form was then signed at the first visit by both the parent and the adolescent. Twenty subjects (age range=15.5 to 16.6 years) were consented. Ten of all participants were females. None of the participants had previous on-road driving experience.

Procedure: On-road driver training/evaluation - All participants met with a certified driving instructor at the Albemarle High School’s (Charlottesville, VA) driving range, where the instructor oriented the novice driver to a Ford Taurus sedan with dual brakes. Next, the instructor modeled for the participant how to drive through the driving range, that included two left turns, three stop signs/lines and cones along the center lane. Following this the student drove the range twice, with verbal instruction from the instructor following each lap. Next, the instructor drove the participant to a quiet residential community, where the student drove down four cul-de-sacs, and negotiated four right turns, with verbal instruction while driving and at the end of each cul-de-sac. Finally, the participant drove on a busy rural road for five miles, again with verbal instructions. Verbal instruction focused on the variables listed in Table 1. At the conclusion of this drive the instructor rated the student on the seven parameters that appear in Table 1(C1-C7). The instructor rated each item in terms of “How well did the driver perform?” on a scale from -3 = “Very Poor”, 0= “Neutral” to +3 = “Very Good”.

Driving Simulator: The virtual reality Model T³ high fidelity driving simulator provides 180° field of view, with rear and side view “mirror” images, optional 5-speed manual transmission, turn signal, real size brake/gas pedals and steering wheel,”shoulder seat belt, and air conditioner for temperature control. Model T³ has equivalent driving scenarios. Each scenario involves a 12 mile course that includes 3 miles of rural, 5 miles of highway,
In-Vehicle Cell Phone Blocking Systems: Implications for Teen Driving Safety

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In an attempt to protect teen drivers, companies are releasing technologies designed to prevent teens from texting while driving. These solutions generally block incoming and outgoing cellular signals through a variety of means. This article discusses the available types of systems and what questions surround their use and justification.

Numerous studies have demonstrated that the use of cell phones while driving increases drivers' risk. Some research indicates that cell phone-using drivers are 400% more likely to experience a collision (McEvoy, et al., 2005). Further, teen drivers have been shown to be very susceptible to distractions, especially activities that take their eyes off the road. Text messaging has also been shown to be very risky to teen drivers, although there is less research on text messaging to date.

In response to these increased risks, many states prohibit teens from using cell phones while driving. Education efforts are also underway, including programs to help driver education instructors discuss the dangers of talking and text messaging on cell phones while driving with their students (AAA, 2007).

Technological solutions aimed at reducing the risks teen drivers face are not new. For many years, “black boxes” have been available to parents of teen drivers. More formally called event data recorders, these systems are capable of capturing data about a teen drives, and of providing feedback to either the driver, his or her parents, or both. These devices generally measure maximum speed, how aggressively the vehicle is driven (hard braking, acceleration and turning, measured via accelerometers), location (via GPS), and time spent driving. Some devices also inform the driver when he or she is exceeding the speed limit, and others are capable of informing parents when the teen drives outside preset geographic boundaries (a.k.a., geofencing). Research continues on these systems, manufacturers of which include Drivecam, GreenRoad, In-Drive and Tiwi, just to name a few.

The latest technological systems are aimed squarely at cell phone use while driving. Using a variety of approaches, these in-car cell phone blocking systems basically render a driver’s cell phone inoperable while he or she is driving. As a result, the teen driver cannot make or receive calls, send or receive text messages, access the internet, or send or receive email. One exception: in case of emergency, drivers can still dial 911 or one of several pre-programmed numbers (such as mom or dad) only.

These systems accomplish their goals through a variety of approaches, including:

- Software integrated into the cell phone in concert with the cell phone service provider
- Using a special housing around the ignition key that communicates to the system that the teen is driving
- Creation of a no-cell “bubble” immediately around the driver
- Locking the phone’s keypad when the vehicle exceeds 10 mph and suppressing incoming calls.

Of course, any attempts to “hack” the system to disable it are automatically detected and immediately reported to the parent-busted! Further, some of these systems also immediately alert parents of attempts to use the cell phone while driving, even if the system prevents its use.

In-car cell phone blocking systems are relatively new to the market. As such many questions about their performance and market potential still exist, including:

- Do they do what they are claimed to do? That is, are they valid?
- Do they do so consistently?
- That is, are they reliable?
- Are parents willing to pay the fees involved?
- To what degree might parents who purchase such a system use it as justification to be less involved in the teen’s learning-to-drive process? For example, to what degree would the parent conduct less supervised practice driving?
- To what degree are attempts to disable the system actually detected?
- To what degree is it possible for a teen to actually defeat the system?
- How likely are teens to just swap phones with a friend in order to stay in touch while driving?
- How do they affect the relationship between the teen and his/her parents?

Regardless of how these systems perform, distracted driving remains an enormous threat to traffic safety. Teens, who are especially susceptible to distractions while driving, deserve special attention. Perhaps by applying a multiple of approaches, including education, legislation and technology, the risks of distracted driving among teens can be reduced. Hopefully, more research will be conducted soon on in-car cell phone blocking systems to assess their actual potential in reducing teens’ driving risk.

References


Text Messaging While Driving: “R U UP 2 Speed?” The ADTSEA Chronicle, Fall 2008.

ADTSEA
A Letter to the Driver Education Community

I am pleased to forward the recently published **Novice Teen Driver Education and Training Administrative Standards**. This new document represents the best efforts of professionals from a wide spectrum of interests to provide guidance that will enhance both the uniformity and professionalism of driver education across the Nation. These administrative standards complete a set of three guidance documents that will assist States in planning and implementing effective driver education systems. Together with the model curriculum developed by the National Highway Traffic Safety Administration and the American Driver and Traffic Safety Education Association in 2005, and the model education standards introduced by the two organizations in 2007, these new administrative standards provide a comprehensive framework for State driver education systems. The framework follows a professional education approach, allowing flexibility for local conditions and efficiency for periodic technical updates, while promoting consistency and quality assurance across programs and among States.

We called on leading experts in the driver education professional community to take on the task of creating these administrative standards – and we look for their assistance in implementing them. Ultimately, it will be the driver education professional community that will play the key role in promoting and implementing the standards. The driver education state administrators, teachers (both private and public), curriculum developers, researchers, school owners, and association members must recognize the importance of agreeing on common principles in order to move forward.

NHTSA will help. We will encourage the highway safety community to promote these standards and to support efforts to maintain, upgrade and expand their State driver education system. NHTSA will also take part in efforts to bring the wide spectrum of driver education professionals and organizations together to coordinate uniform delivery of driver education and acceptance of professional standards.

NHTSA supported the development of this document, but these standards are not NHTSA’s creation. They represent the best thinking of the driver education community. As a highway safety professional, you can play an important role in implementing these standards and improving driver education systems across the nation. I thank you in advance for your efforts.

Brian McLaughlin, Senior Associate Administrator
National Highway Traffic Safety Administration

Novice Teen Driver Education and Training Administrative Standards

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**Forward**

A driver’s license represents considerable freedom to a young person. Parents, too, may eagerly look forward to the additional help that a teen driver provides to an American household. In addition, mobility is an important factor for today’s teens as well as a key factor in the economic and social growth of our country. Teens view this mobility as evidence of becoming adults. Unfortunately, these freedoms and conveniences come at a high price, which continues to be paid via traffic-related fatalities, life-altering injuries, and economic costs. Crashes continue to be the leading cause of death among American teens, accounting for more than one third of all deaths of 16- to 19-year-olds. The crash rate is greatest among 16-year-olds, who have the most limited driving experience and an immaturity that often results in risk-taking behind the wheel. This segment of new drivers has been over-represented in U.S. crash statistics since tracking began and continues this distinction in current driving population demographics. The social costs of these senseless tragedies are immeasurable.

While the value of novice teen driver training and education has long been a subject of debate among researchers, educators, and others in the transportation and traffic safety community, it continues to be the primary introduction to the driving task for American teens.

McKnight \(^3\) (1985) writes, “...it is clearly something of a distortion to attribute accidents to driver education just because it leads to driving. Any group of people that drive will have accidents. By agreeing to license them, society accepts that risk. Driver education is simply a means of achieving a socially accepted goal.” Enhancing consistency and providing guidance to States seeking to improve the novice teen driver education and training experience was the goal of the Working Group as it convened to craft the Novice Teen Driver Education and Training Administrative Standards.

The implementation of the resulting standards is a first step and is intended to assist driver education
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(from page 11)
and training professionals in
providing the administrative
framework to teach novice teen
drivers the skills and transfer the
knowledge necessary to perform as
safe and competent drivers, thereby
contributing to the reduction of
crashes, fatalities, and injuries. The
Working Group deliberated,
considered the current evidence,
and reached consensus on the
material that follows. It reflects the
collective knowledge and experience of both research and
practice in driver education and
training today.
This document represents a
collaborative process by public,
private professional, parental,
government, nonprofit, and research
organizations to identify and
develop standards for an ideal State
driver education and training
program. This document is a starting
point, and the Working Group
recognizes that in some standard
areas there is insufficient research
and data to determine the ideal
standard. In these instances, the
standards represent the highest
level of expert design upon which
the Working Group could agree.
Much like the initiation and
evolution of best graduated driver
licensing (GDL) practices, these
driver education and training
administrative standards must be
accompanied by a commitment for
ongoing funding and research to
test, refine, and redefine the best
practices for the ideal State driver
education and training program. The
next step should include consensus
curriculum content standards and
benchmarks.

Preamble
The Novice Teen Driver
Education and Training
Administrative Standards set forth in
this document serve to guide all
novice teen driver education and
training programs in States striving
to provide quality, consistent driver
education and training. While noting
that administering education
standards and policies are a State’s
right, these standards were created
to serve as an anchor for State
policies on driver education and
training with the following
understandings:
The goal of driver education and
training is to transfer knowledge,
develop skills, and enhance the
disposition of the teen, so he/she can
perform as a safe and competent
driver, thereby contributing to the
reduction of crashes, fatalities, and
injuries.
Driver education and training
should be an integral part of the GDL
system.
Driver development should be a
lifelong learning process.
Driver education and training
should be a phased education
process.
Driver education and training
standards should help an
organization be successful in
administering and/or providing quality and uniform driver education
and training, consistent with the
latest advances in methodology,
safety, subject matter, and technology.
Any standard promulgated for
driver education and training must be
supported with a communication
strategy for all stakeholders.

Background
These standards were developed by
representatives from the driver
education professional community
with assistance from NHTSA. The
approach to developing these
standards was as follows:
Review a cross-section of State-
level driver education and training
standards, curriculum content, and
delivery requirements to determine
how they can help shape national
standards of oversight, delivery,
monitoring, and evaluation of State
and local driver education and
training programs. Research, review,
and compare driver education and
training-related documents from the
following stakeholder organizations:
NHTSA;

The Chronicle
1.0 Program Administration

All entities delivering driver education and training should be treated fairly and equitably, meet the same quality standards, and have equitable access to State driver education and training resources. Most States may have a multitude of public and private novice teen driver education and training programs. Each State may have different administrative and provisional structures. Alternative delivery (e.g., online, parent-taught, and correspondence) programs can be either public or private, may not have a physical location, and are subject to varying requirements set forth by the State.

1.1. Management, Leadership, and Administration

Each State should:

1.1.1 have a single agency, or coordinated agencies, informed by an advisory board of stakeholders and charged with overseeing all novice teen driver education and training programs. That agency should have authority and responsibility for the implementation, monitoring, evaluation, and enforcement of these standards. This agency should also be charged with developing and executing communication strategies to inform parents and the public about driver education and training issues. In addition, the agency should inform providers in a timely fashion about changes to laws, regulations, and procedures.

1.1.2 carefully choose a State agency that is best suited and ideally not a direct provider of driver education to administer a statewide education and training program that can provide needed and appropriate regulatory environment, oversight, monitoring, evaluation, review and approval processes, professional development, and all other administrative actions that make available a quality driver education and training program to all age-eligible residents.

1.1.3 have a full-time, funded State administrator for driver education and training. This individual should meet or exceed the qualifications and training required by the State for a novice teen driver education and training instructor and/or school owner or possesses equivalent experience or qualifications. This administrator should be an employee of the agency that has oversight of driver education and training.

1.1.4 have standardized monitoring, evaluation/auditing, and oversight procedures to ensure that every driver education and training program uses a curriculum with written goals and objectives.

1.1.5 have a program renewal process to ensure that curriculum material and procedures are current.

1.1.6 adopt an instructor certification renewal process.

1.1.7 approve driver education and training programs that conform to applicable State and national standards.

1.1.8 deny or revoke approval of driver education and training programs that do not conform to applicable State and national standards.

1.1.9 ensure that programs reflect multicultural education principles and are free of bias.

1.1.10 administer applications for licensing of driver education and training instructors, including owner/operators of public and private providers.

1.1.11 develop and execute monitoring, evaluation, and auditing procedures to ensure standards are met by public and private providers.

1.1.12 adopt goals, objectives, and outcomes for learning.

1.1.13 develop criteria to assess and approve programs, curricula, and provider effectiveness. Financial and/or administrative sanctions for non-compliance with the State application and approval processes and/or standards should be provided to all applicants and provide remediation opportunities to driver education and training programs when sanctions are issued.

1.1.14 establish and maintain a conflict resolution system for disputes between the State agency and local driver education and training programs.

1.1.15 require, provide, or ensure the availability of ongoing professional development for instructors to include updates in best education and training methods and material.

1.1.16 require all public and private driver education and training providers to report program data to the designated State agency so that periodic evaluations of the State’s driver education and training...
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(from page 13)

programs can be completed and made available to the public.

1.1.17 ensure that student information submitted to the agency or used by the agency remains confidential, as required by applicable State and Federal regulations.

1.1.18 ensure that all novice teen driver education and training programs, instructors, and associated staff possess necessary operating licenses and credentials required by the State.

1.1.19 ensure that each driver education and training provider has an identified person to administer day-to-day operations, including responsibility for the maintenance of student records and filing of reports with the State in accordance with State regulations.

1.1.20 ensure that all materials, equipment, and vehicles are safe and in proper condition to conduct quality, effective driver education and training.

1.1.21 refer to a general standard for online education such as those established by the North American Council for Online Learning in the absence of national standards specific to the delivery of online driver education or online teacher preparation.

1.1.22 ensure that the instruction of novice teen drivers is completed using concurrent and integrated classroom and in-car instruction where the bulk of the classroom instruction occurs close in time to the in-car instruction to ensure the maximum transfer of skills.

The in-car instruction can be enhanced with simulation or driving range instruction.

2.0 Education/Training

2.1 Each State should:

2.1.1 have driver education and training that meets or exceeds current nationally accepted content standards and benchmarks.

2.1.2 approve curricula that are based on nationally recognized standards such as ADTSEA and DSAA – Attachments E and F. Each State retains authority in determining what curricula meet its State standards. Other resources include AAA and NIDB.

2.1.3 regulate the use of simulation and driving ranges.

2.1.4 require an approved end-of-course knowledge and skill assessment examination based on the stated goals and objectives to graduate from the driver education and training program.

2.1.5 require a course provider to conduct valid post-course evaluations of driver education and training programs to be completed by the students and/or parent for the purpose of improving the effectiveness of the program (a resource for help in conducting these evaluations is the AAA Foundation for Traffic Safety).

2.1.6 require core driver educational hours that focus on the driving task and safe driving practices sufficient to meet the criteria established by the end-of-course examination. To enable States to select the appropriate guidelines for contact hours to meet the desired outcomes, the following instructional time should be:

First stage education:
- Minimum of 45 hours of classroom/theory;
- Minimum of 10 hours of behind the wheel instruction;
- 10 hours in-car observation;

Second stage education:
- Minimum of 10 hours; and.

3.0 Instructor Qualifications

3.1 Each State should:

3.1.1 require the following prerequisites for instructors receiving certification and recertification:

a) possession of a valid driver’s license, as recognized by the State.

b) have an acceptable driving record as determined by the State.

c) pass a Federal and State criminal background check.

d) meet health or physical requirements as determined by the State.

e) achieve a minimum academic education requirement as determined by the State.

f) meet a minimum age requirement as determined by the State.

3.1.2 require instructors to complete approved standardized instructor training that applies to instructors and teachers in all public and private driver education and training programs. This preparation should include a course of study that is no less than 120 hours of preparatory time. (See Attachment B, Instructor Qualifications Statement)

3.1.3 require instructors to receive training in accepted best practices in course delivery and evaluations using various delivery modalities.

3.1.4 require that an instructor pass a State-approved practical and/or written exam (e.g., Praxis II, National Teacher Certification Program [available at www.ADTSEA.org]).

3.1.5 require annual continuing education and professional development hours for instructors.

3.1.6 require an annual driving record review for instructors.

4.0 Parent Involvement

4.1 Each State should:

4.1.1 require the parent of a teen driver education and training student to attend a parent seminar, pre-course, or the initial session of the teen’s driver education and training course. This session should outline the parent’s responsibility and opportunity to reduce his or her teen’s crash risk in several ways, including modeling safe driving behavior. Information conveyed to the parent in this session should include, but not be limited to, the following known best practices of GDL and parental involvement:

a) Manage the novice driver’s learning-to-drive experience to (continued on page 15)
determine the readiness of the teen to begin the process, and supervise the teen’s driving so that the parent can better determine the teen’s readiness to advance to the next licensing stage and assume broader driving privileges; 
b) Supervise an extended learner permit period of at least six months that provides at least weekly opportunities for the novice driver to accumulate a minimum of 50 hours of supervised practice driving in a wide variety of increasingly challenging circumstances. Hours of supervised practice driving required in GDL should not be reduced by a novice driver’s participation in other driver education and training programs, nor should any other activity be considered a substitute.
c) Supervise an extended intermediate license period that temporarily restricts driving unsupervised with teen passengers and during nighttime hours until the State’s GDL requirements have been met and the parent determines the teen’s readiness to drive unsupervised in these high risk conditions; and 
d) Negotiate and adopt a written agreement between the teen and parent that reflects the expectations of both teen and parent and clearly defines the restrictions, privileges, rules, and consequences that will serve as the basis for the teen to earn and for the parent to grant progressively broader driving privileges.
4.1.2 require a parent to complete a debriefing with the driver training instructor to inform the parent of the progress and proficiency of the teen driver. This final session should include a reminder that it is the parent who must ultimately determine the teen’s readiness to obtain a license with full driving privileges and of the parent’s responsibility and important role in helping the teen to become a safe driver.

5.0 Coordination With Driver Licensing

5.1 Each State should:
5.1.1 have a formal system for communication and collaboration between the State driver education and training agency and the State driver licensing authority. This system should allow sharing of information between driver education and training program/course administrators and the State's driver licensing authority.
5.1.2 have a GDL system that includes, incorporates, or integrates driver education and training. Completion of driver education and training should not reduce the time requirements in the GDL process.
5.1.3 provide information and education on novice teen driving requirements and restrictions to judges, courts, and law enforcement officials charged with adjudicating or enforcing GDL laws.
5.1.4 ensure that sanctions for noncompliance with GDL requirements by novice teen drivers are developed and enforced uniformly.
5.1.5 require a parent to submit State-specified documentation that certifies completion of required supervised hours in a manner that reduces the possibility of fraudulent entries.
5.1.6 ensure that State licensing tests are empirically based and reflect performance competencies of the standards-based driver education and training program outlined in the previous sections of this document.
5.1.7 develop and implement a valid and reliable driver’s knowledge and skills test that assesses factors associated with the novice teen driver’s ability to reduce driving risks.

Attachment A – Definitions

Administrator – manager (affairs, a government, etc.); having executive charge of.

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Advanced driving skill program – an additional driving program designed to promote safe driving skills outside of the novice training.
Alternative delivery – delivery of the theory portion of driver education using channels other than the traditional classroom, such as Internet-based, correspondence-based, and parent-taught.
Behind-the-wheel – actual instructional driving time during which the novice teen driver drives on streets and highways, and is guided by an instructor in the front passenger seat. Observation is not included in behind-the-wheel time.
Certification – to award a certificate to a person attesting to the completion of a course of study or the passing of a qualifying examination.
Classroom content – that part of the driver education and training program that imparts the knowledge, theory, principles, laws, rules, best practices, and related curriculum content through student-centered activities, lecture, media, programmed instruction, independent study, correspondence, and other effective techniques.
Classroom setting – the delivery of the classroom portion of the curriculum is not limited to a traditional physical location, but includes the services of a professional instructor/facilitator in a variety of physical, real-time, online, and video settings. It may include home-based and parent-taught or parent-facilitated venues in which case the services of a professional instructor may or may not be required depending on State law. It does not include observation time or behind-the-wheel instruction.
Concurrent instruction – the practice of using in-vehicle, classroom, simulation, and driving range-based teaching methods simultaneously.
Confidential – spoken, written, acted upon, etc., in strict privacy. (continued on page 16)
Consistent – agreeing or accordant; compatible; not self-contradictory; constantly adhering to the same principles, course, form, etc.
Content – the subject matter taught in driver education and training.
Correspondence-based driver education – a driver education program in which the classroom/theory portion is completed by the student at the student’s home location and at the student’s personal pace.
Credentialed(s) – evidence of authority, status, rights, entitlement to privileges, or the like, usually in written form.
Curriculum – the overall program of instruction, including classroom, behind-the-wheel, observation, simulation, or driving range instruction. Generally required to be approved by the State in which the program is delivered.
Distributive learning – where the acquisition of knowledge and skills is spread over a longer period of days and weeks with fewer hours of instruction in a day, as opposed to fewer days and weeks, but more daily hours of instruction resulting in the same amount of hours.
Driving log – a written record of supervised motor vehicle operation time maintained by the student and authenticated by the parent/driving supervisor.
Driving range – a defined roadway course closed to public traffic and allowing for the re-creation of various basic driving scenarios, used for driver training.
Driving range instruction – use of a closed course to instruct novice teen drivers.
Evaluate (evaluation) – to examine and judge carefully; appraise, usually applied to students throughout their driver and education and training program.
Graduated driver licensing (GDL) – a State-run and enforced system under which novice teen drivers’ privileges are granted in phases to restrict beginners’ initial experience behind the wheel to lower-risk situations. The restrictions gradually are lifted, as experience is gained so novice teen drivers are more experienced and mature when they get their full, unrestricted licenses. Immediately sequential – occurring within 72 hours of the first phase.
In-car instruction – consists of behind-the-wheel training and observation training time.
In-vehicle assessment techniques – approach used by an instructor to monitor and objectively measure student vehicle operation and safe driving behaviors.
Instruction techniques – approach used by an instructor to transmit information to students.
Instructor – the person who delivers the curriculum; includes certified classroom and behind-the-wheel instructors.
Intermediate permit – the mid-phase driving permit in the GDL system.
Knowledge – the fact or state of knowing; the perception of fact or truth; clear and certain mental apprehension; acquaintance with facts, truths, or principles, as from study or investigation.
Learner permit – the initial driving permit in the GDL system.
Licensing (for novice teen drivers) – formal permission from a governmental authority to operate a motor vehicle on public roadway.
Licensing (for driving schools) – formal permission from a governmental or other constituted authority to operate a driving school.
Lifelong learning – the ongoing formal and informal acquisition of knowledge or skills.
Measure – to ascertain the extent, dimensions, quantity, capacity, etc., of, especially by comparison with a standard; to judge or appraise by comparison with something or someone else.
Monitoring, evaluation/auditing – recording, regulating, or controlling of contextual knowledge.
Phased education – the incremental introduction of concepts, skills, and techniques based on the acquisition of foundational knowledge.
Private driving school – a driver education program that is delivered by a business entity.
Professional development – the ongoing acquisition of knowledge, skills, and awareness of new or (continued on page 17)
emerging issues by driving instructors, generally required as a condition of certification as an instructor by a State.

Program – the full scope of delivery of novice teen driver education, including both classroom/theory and behind-the-wheel instruction.

Provider – the legal entity ("private" or "public") that offers a driver education program.

Public driving school – a driver education program that is delivered by a political subdivision of the State.

Report – to give or render a formal account or statement of.

Second-stage driver education and training – education and training that occurs after formal driver education and training is completed. This can include classroom and/or behind the wheel and is conducted under the supervision of a qualified driver education and training instructor. Simulation – using interactive computer programs which imitate real or imaginary driving scenarios. Often used to create events that would normally be impossible, difficult, or dangerous to the novice teen driver (www.learning.ac.nz/mod/glossary/view.php).

Simulator – a replica of basic vehicle controls and instruments that allows student response to driving situations. An electromechanical device designed to represent the driver’s compartment of the automobile and with the use of films, video programs, or computer-generated multimedia attempts to develop judgment, decision-making skills, behavior response, and manipulative skills essential in learning to drive.

Skill – the ability, coming from one’s knowledge, practice, aptitude, etc., to do something well; competent excellence in performance.

Standard – something considered by an authority or by general consent as a basis of comparison; an approved model; a rule or principle that is used as a basis for judgment.

Standardized – to bring to or make of an established standard size, weight, quality, strength, or the like.

Theory – while “theory” specifically refers to the general principles of the body of knowledge related to driving, including the ideal set of facts, principles and circumstances for driving, it is sometimes used as a substitute for “classroom” when referring to driver education - as in “…the classroom or theory portion of driver education.”

Attachment B - Instructor Qualifications Statement

Quality instructor training is the backbone of quality driver education and training; therefore it is an important component for helping to produce a safe teen driver.

1.1 Instructors should be required to complete approved standardized instructor training that applies to instructors/teachers in all public and private driver education and training programs. This preparation should include a course of study that is no less than 120 hours of preparatory time.

1.2 Courses to prepare instructor/teachers should include both theory and laboratory education. The following competencies for classroom and in-car instruction should be achieved:

- Ability to recognize and explain the general nature of the drivers’ task within the highway transportation system and the consequences of system failures;
- Ability to apply risk management skills to the task of driving as a driver or passenger;
- Ability to apply and explain the principles of perception to risk management when operating a motor vehicle;
- Ability to apply and explain the techniques for managing risk when operating a motor vehicle over pre-selected on- and off-street activities;
- Ability to recognize and identify physical, social, and psychological influences that can affect motor vehicle operator performance;
- Ability to demonstrate concepts and generalizations that enable one to make objective decisions regarding the: use of alcoholic beverages and drugs; use of occupant restraints and protective devices; consequences of speed selection; consequences of fatigue, drowsy driving, and road rage; environmental factors that influence the decision-making process; use of visual skills to obtain appropriate information to make reduced-risk decisions in low, moderate, and high risk driving environments; management of time, space, and visibility when operating a motor vehicle; interaction with other roadway users in a positive manner; demonstration of balanced vehicle movement; additional skills practice with parents/guardians/mentors; identification of laws, rules, and regulations that govern the smooth movement of traffic; use of current methodologies for providing classroom instruction in driver education including organization, classroom management, and technologies; and use of current methodologies for providing in-car instruction in driver education including route development, giving directions, positive evaluation feedback, and evaluating driver performance;
- Ability to identify and support rules and regulations governing a State’s GDL program;
- Ability to demonstrate knowledge of the State-specific rules of the road;
- Ability to demonstrate vehicle operation and control from the right passenger position;

(continued on page 18)
1.3 Each State should require that courses offered to fulfill instructor preparatory requirements include the following outline and topics:

1.3.1 Driver task analysis: a course that is designed as a prerequisite to provide instructors with the content knowledge and skills necessary to teach driver education and to attain established instructor competencies. These suggested topics are a minimum and may be expanded:

- Preparing for State-administered written examination;
- The task of the driver in the highway transportation system (HTS);
- Personal factors influencing operator performance;
- Motor vehicles laws, regulations, and their application;
- Managing risk within the HTS;
- Sensory perception and performance of the driving task;
- Improving driver performance;
- Motor vehicle performance capabilities and maintenance;
- Legal and moral obligations relative to using the HTS;
- Trip-planning;
- Student learning styles;
- Instructional technique and pedagogy;
- Student evaluation and management;
- Instructor/ student-centered activities; and
- Preliminary driver performance audit.

1.3.2 Vehicle operational and instructional skills: a course that is designed to provide instructors with the knowledge and skills necessary to successfully conduct in-car instruction, provide a safe learning environment while doing so, and evaluate new driver performance.

- Risk management principles in driving situations;
- Factors that influence learning and habit development;
- Standards for driver performance;
- Laboratory learning environments;
- Planning and preparing for instructional performances and outcomes;
- Planning vehicle operational experiences;
- Planning off-street laboratory experiences;
- Planning on-street laboratory experiences;
- Techniques for student performance assessment;
- Involving mentors in the learning process;
- Local curriculum and program needs; and
- Crash avoidance.

1.3.3 Classroom knowledge: a course designed to provide the instructor with the knowledge and skills necessary to provide quality student centered classroom instruction, successfully manage the classroom, and provide for appropriate student evaluation and assessment.

- Course introduction, scheduling and grading;
- Risk management principles in all driving situations;
- Influencing learning and habit development;
- Standards of driver performance;
- Classroom learning environments;
- Planning for classroom experiences;
- Planning for computer-assisted instruction;
- Instructor characteristics and techniques;
- Planning for simulation-based instruction;
- Assessment of student performances;
- Course assessments;
- Planning for local curriculum and program needs;
- Classroom lesson plan development;
- Classroom lesson presentation; and
- Knowledge of State rules of the road, driver licensing, and penalties for improper driver behavior.

Attachment C - The Working Group

Bud Chauncy, Owner, First Class Driving School, Bossier City, LA; Past President, Driving School Association of the Americas (DSAA)

Troy Costales, Governor’s Representative and Director, Oregon DOT, Traffic Safety Division

Barbara Harsha, Executive Director, Governor’s Highway Safety Association (GHSA)

John Harvey, Program Manager, Driver Education, Oregon DOT, Traffic Safety Division; Past Chairman of the Board, Driver Education and Training Administrators (DETA)

David Huff, Director, Montana Office of Public Instruction, Traffic Education Program/Driver Education; Chairman of the Board, DETA

John Kennedy, Group Vice President, National Safety Council

Kevin Lewis, Vice President of Driver Programs, American Association of Motor Vehicle Administrators (AAMVA)

Dan Mayhew, Senior Vice President, Traffic Injury Research Foundation

Jim Nichols, Highway Safety Researcher

Debbie Prudhomme, Owner, Training Wheels Driver Education, Maple Grove, MN; Central Vice President, DSAA

Kevin Quinlan—National Transportation Safety Board (NTSB)

Marshal Rafael – NTSB

Allen Robinson – Chief Executive Officer, American Driver and Traffic Safety Educator Association (ADTSEA)

John Svensson, President, Training & Research Institute of Advanced Driver Development (TRIADD); President, DSAA

William Van Tassel, Manager of Driver Training Operations, AAA
Students acquiring English must practice the language. The driver education teacher can facilitate English proficiency by providing activities and opportunities that promote the frequent use of English. Simply put, the more a student uses English the more proficient he/she becomes.

Sample Lesson
Here is a sample lesson on right-of-way principles that has been designed to meet the learning needs of students at all proficiency levels. Note how the lesson encourages students to learn both the driver education content and the English language concurrently. The content objectives are specific to right-of-way principles and consistent with the DMV Driver’s Manual that is generally written at the sixth grade reading level (Miller, 2006). Language objectives are especially meant for English learners to develop their ability to use vocabulary as it relates to who yields the right-of-way to whom in various traffic situations. A total class time of 50 minutes has been allotted to the lesson.

The lesson opens with a brainstorming activity that allows the teacher to determine students’ entering behavior (i.e., existing content knowledge and language proficiency) by posing pictures and asking questions related to students’ perception, interpretation and understanding of traffic situations requiring right-of-way decisions. This might require increased wait time for students to understand what is expected of them and prepare their responses. Next, the instructor delivers a lecture on the 9 principles of right-of-way accompanied by teacher demonstrations using magnetic cars on the marker-board (i.e., manipulatives). All the while, the teacher refers to key vocabulary terms conspicuously posted in the classroom. After that, students work cooperatively in small groups to answer a fill-in-the-space worksheet on right-way decisions in 9 traffic situations. With time remaining, one student from each group, preferably an emerging English learner, is encouraged to present his/her group’s responses from the worksheet. The students can also expect an end of unit test on the material covered. A homework assignment is issued directing students to interview their parent(s) about the latter’s experiences in following right-of-way principles on the road. To clearly communicate expectations for this assignment, the teacher can enter into a “mock” interview in front of the class by playing the role of parent and having a volunteer student pose the questions.

Throughout this lesson are opportunities for the teacher to reinforce key vocabulary and encourage student expressions through social and academic English. For example, all students can maintain a personal dictionary of driver education terminology. During the brainstorming activity, students at all proficiency levels are solicited for their initial understanding of right-of-way in intersections. If a student hesitates and displays difficulty in describing the illustration, the teacher can direct his/her attention to the posted vocabulary while enunciating the respective term(s). If necessary, the instructor can rephrase rather than repeat what is expected of the students.

While lecturing on the 9 principles of right-of-way, the teacher explains concepts, delivered at an appropriate pace, and demonstrates through magnetic cars and illustrations on the marker board. A student appearing either inattentive or confused can be asked to assist
Working with teacher, etc.). Whereas cooperative groups, in pairs, or other configurations (e.g., urged to talk amongst each other. Whereas proficiency levels with members urged to talk amongst each other. The teacher can experiment with other configurations (e.g., cooperative groups, in pairs, working with teacher, etc.). Whereas each group member benefits from the supportive and informative nature of the group dynamic, the ultimately goal is for each student to be able to represent his/her group in reporting results to the whole class. Some students may need more group work. Others might require more modeling by teacher and other students. Eventually, each student should rely less upon the group as he/she moves toward working independently. Of course, the end of the unit test would be a measure of content mastery. The homework assignment is an opportunity to connect both learning of content and language to the students’ cultural backgrounds. By interviewing parents and then writing a transcript, the students practice their reading and writing skills.

Lesson: Right-of-Way Concepts:

Right-of-way rules determine who should yield at an intersection or merge area. In every situation, right-of-way is a privilege to be given and not one that is taken by a driver.

At times drivers must yield access to the roadway to other users. Right-of-way principles are based on giving the privilege of passage to others and drivers should realize right-of-way can not be taken. Right-of-way is determined by a set of established rules to be followed in given traffic situations:

1. Intersections controlled by signs and signals.
2. Single or two-lane road intersecting with multiple-lane roads.
3. Multi-lane intersections not controlled by signs and signals.
4. Turning left.
5. Private roads and driveways.
7. Entering or leaving controlled-access highway.
8. Driving on multiple-lane roadways.
9. Railroad grade crossings.

Brainstorming: Before lecture, instructor displays pictures of right-of-way traffic situations asking students. For example: Have you ever seen this (yield) sign? What is the meaning of a yield sign (what does it say)? What is this? (a traffic signal) What is a traffic signal trying to say? Here is a walker (pedestrian). When should the pedestrian enter the intersection?

Lecture: Teacher presents material on right-of-way principles with references to hand-out as well as to posted key vocabulary. Teacher models right-of-way decisions using magnetic car and intersection drawings on marker board.

Throughout lecture, the teacher enunciates key vocabulary words: intersection, privilege, merge, railroad crossing, right-of-way, yield, and zone, etc.

Small group work: Each student refers to the hand-out on right-of-way principles. Then group members help each other complete a fill-in-the-blank worksheet on 9 right-of-way traffic decisions. Students report their small group work results to the class. Enlarged pictures on poster board of automobile and pedestrian traffic in intersections, and railroad crossings.

Students’ personal vocabulary dictionary

Hand-out containing the 9 right-of-way principles in enlarged font with key vocabulary words highlighted

Magnetic cars

Fill-in-the-blank worksheet

Brainstorming allows instructor to assess students’ content knowledge and linguistic skills

Teacher observes students who might be inattentive or confused about the content.

Teacher collects each student’s worksheet and checks for completion and accuracy.

Students will be administered an end-of-unit test

Homework assignment(s): Students interview their parent(s) regarding right-of-way experiences. The student asks parent(s) to respond to 9 different traffic situations requiring a right-of-way decision. Then the student asks parent(s) about personal right-of-way experiences. Afterward, the student writes a summary of the parent(s)’ experiences.

Conclusion

Teaching driver education to English learners might seem formidable. However, well-planned lessons with strategies and activities relevant to proficiency levels should facilitate what comes naturally to most instructors. Simply, we need to be good teachers who use a variety of methods to help students meet both content and language objectives. We should model expected behaviors and encourage
Instructors should confer and reach consensus with interpreters, parents and the hearing impaired students before using these signals behind-the-wheel.

and 4 miles of urban driving, taking approximately 5-6 minutes to traverse each segment. Although all driving scenarios involve the same road course, the traffic patterns and driving demands differ between scenarios, e.g., each scenario has one signaled sudden stop (such as a lead car’s brake lights suddenly come on and rapidly decelerates), and two sudden stops that are not signaled (such as a car in a parallel lane suddenly pulls into driver’s lane).

Simulation Adaptation Syndrome (SAS) Prevention Protocol: SAS refers to nausea, disorientation, headache, and problems with focusing, sometimes experienced while or shortly after operating a simulator. In order to minimize or avoid SAS, we employed the following protocol:

1. All components of the projected image were displayed at the correct geometric angle. As a result, visual flow was not compressed or expanded from that normally expected and experienced during on-road driving.
2. The air conditioner in the Model T3 was activated before each drive, maintaining air movement and comfortable temperature.
3. In order to desensitize participants to the simulator, the driving scenario was initially introduced in 3 minute “doses”, after each of which subjects looked away from the screen, relaxed, and were asked to rate their SAS symptoms on a “0” (feel fine) to “4” (feel so bad, I have to stop right now) scale. These scenarios involved no traffic.
4. Participants were introduced to the simulated scenarios progressively. During the initial exposure to the Model T3 only the center projector was illuminated.

Once the center screen could be viewed for 3 minutes without SAS, the two side projectors were activated with half brightness for the next 3-minute dose. Subsequently, the side projectors were turned up to full brightness for the next dose.

Virtual Reality Driver Training Procedure: VRDT was administered by a peer (a 16 year old female who had had her independent driver’s license for four months at the time this study commenced). Training employed a simulated rural, highway and urban road course. During low demand/no traffic conditions, subjects practiced:

1. Maintaining center lane position
   a. while driving on a straight road and curvy roads
   b. when executing both right and left hand turns
2. Maintaining speed control with the accelerator
   a. following posted speed limits
   b. detecting and responding to speed limiting / altering conditions, e.g. road construction and school zones
3. Appropriate application of brakes
   a. stopping at stop lines
   b. smooth deceleration at signaled stops and rapid deceleration at sudden stops
   c. avoidance of foot confusion, that is not hitting the clutch or the gas pedal when applying the brakes
4. Appropriate use of turn signals
   a. Using signals at every turn and lane merger
   b. Using signals sufficiently before the maneuver so that the rear traffic was adequately notified of the pending maneuver
5. Appropriate use of side and rear view mirrors
   a. Periodic checking of mirrors
   b. Checking mirrors when passing a slow lead vehicle and merging into traffic

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Once these basic skills were mastered, trainees applied these skills while negotiating progressively heavier and more demanding traffic. Training on these more demanding scenarios focused on tactical driving skills, such as:

6. Decision making on how to manage distracting activities on the side of the road.

7. Complex driving maneuvers such as how to pass a slow lead car or how to merge onto the highway.

Trainees were asked to apply the acquired skills to progressively more demanding traffic scenarios using the following 5 training scenarios shown in the order they were presented to the VRDT subjects:

(a) Course 1A4 had no traffic.
(b) Course 1A3 had only oncoming traffic.
(c) Course 1A2 had oncoming, same lane and cross traffic.
(d) Course 1A1 had oncoming, same lane, cross and signaled sudden stop traffic.
(e) Course 1A had oncoming, same lane, cross, signal sudden stop, and non-signaled sudden stop traffic.

After each drive the instructor reviewed the successes and shortcomings of the trainee’s performance. Immediately prior to beginning a new scenario the instructor reviewed goals for the upcoming trial.

RESULTS

Demographic statistics are presented in Table 1A. Group comparisons of the seven composite scores (Table 1, C1-C7) were made using unpaired t-tests. Composite scores were participants’ summed scores across instructor’s ratings for the respective variables that appear

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>Means ±SD</th>
<th>P level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Demographics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample size</td>
<td>VRDT</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Mean age</td>
<td>VRDT</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>18.2</td>
<td></td>
</tr>
<tr>
<td>% Females</td>
<td>VRDT</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Controls</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

| **B. Simulator Variables Mean ratings: scale= 0= "Not at all" to 4= "Very"** |        |           |         |
| How do you feel right now? (SAS post drive) | VRDT   | 0.1       |         |
| How useful was driving the Road course to improve you’re driving skills? | VRDT | 3.3 | |

| **C. On-road Driving Performance Variables: scale= -3= "Very Poor" to +3= "Very Good"** |        |           |         |
| C.1 Composite Steering Variables              | VRDT   | 3.0 ±1.9  | P=.001  |
| C.2 Composite Turning Variables               |        |           |         |

| **C.1 Composite Steering Variables              |        |           |         |
| How well did the driver maintain lane position, i.e. not swerving | VRDT | 1.8 | |
|                                               | Controls | -1.3 |         |
| How well did the driver maintain center lane position, i.e. not hugging the midline or the curb | VRDT | 1.2 | |
|                                               | Controls | -1.3 |         |

| **C.2 Composite Turning Variables               |        |           |         |
| How well did the driver execute turns in terms of timing, i.e. neither too quickly or too delayed | VRDT | 1.8 | |
|                                               | Controls | -1.2 |         |
| execute turns in terms of speed, i.e. neither too fast or too slow | VRDT | 1.4 | |
|                                               | Controls | -1.3 |         |
| execute turns in terms of steering, i.e. neither too sharp or too wide | VRDT | 1.6 | |
|                                               | Controls | -1.3 |         |
| execute turns in terms of steering, i.e. neither too sharp or too wide | VRDT | 2.7 | |
|                                               | Controls | 2.1 |         |
| execute turns in terms of speed, i.e. neither too fast or too slow | VRDT | 1.1 | |
|                                               | Controls | 1.4 |         |

ADTSEA
because of violating the “parking lot” only driving restriction before the on-road evaluation.

Reactions to the simulator: Only one female participant reported a mild SAS response to the VRDT: a rating of 1 on the 0-4 scale (Table 1B).

Reactions to the simulator: Only one female participant reported a mild SAS response to the VRDT: a rating of 1 on the 0-4 scale (Table 1B). VRDT participants rated the utility of the simulator in improving their driving skills a mean score of 3.3 (maximum score = 4).

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VRDT Effects: As seen in Table 1, C1-C7, participants receiving VRDT performed better than controls on all on-road ratings and that all seven composite scores significantly different (all p values= < 0.006). This was true for both specific driving maneuvers, such as “steering”, as well as for broader concepts such as attention to and attitudes toward driving.

DISCUSSION

Although virtual reality training has been used extensively in the military, and with professional pilot and truck driver training (Hays, Jacobs, Prince, Salas, 1992), this is the first controlled study investigating whether VRDT actually improves on-road driving of novice teenagers. Considering that: (1) VRDT was instructed by a relatively inexperienced teenage driver, (2) all VRDT involved driving the same 12-mile road course, (3) the simulated road course did not

Table 1: Participants’ characteristics, ratings and performance with group means for individual driving parameters and means ±SD for six cluster variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Groups</th>
<th>Means ±SD</th>
<th>P level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C.3 Composite Speed Control Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Means ±SD</strong></td>
<td>VRDT</td>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td>How well did the driver ….</td>
<td>6.6 ±7.2</td>
<td>-4.0±4.0</td>
<td></td>
</tr>
<tr>
<td>maintain appropriate speed relative to posted speed limit, i.e. did not drive over the speed limit</td>
<td>2.6</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>maintain appropriate speed relative to posted speed limit, i.e. did not drive under the speed limit</td>
<td>-0.1</td>
<td>-2.2</td>
<td></td>
</tr>
<tr>
<td>maintain steady speed, i.e. speed variability</td>
<td>1.0</td>
<td>-1.7</td>
<td></td>
</tr>
<tr>
<td>appropriate speed in turns, i.e. decelerate in turns and accelerate coming out of turns</td>
<td>1.1</td>
<td>-1.2</td>
<td></td>
</tr>
<tr>
<td>appropriate speed when approaching same-lane objects like bicyclist, joggers, pedestrians, i.e. slow down when approach, give plenty of room and accelerate after passing</td>
<td>2.0</td>
<td>-0.6</td>
<td></td>
</tr>
<tr>
<td><strong>C.4 Composite Braking Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Means ±SD</strong></td>
<td>VRDT</td>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td>How well did the driver ….</td>
<td>5.4 ±3.3</td>
<td>0.3 ±4.1</td>
<td></td>
</tr>
<tr>
<td>make stops at intersections smoothly, i.e. passenger did not lurch forward</td>
<td>2.6</td>
<td>-0.1</td>
<td></td>
</tr>
<tr>
<td>make stops at intersections at appropriate distance, i.e. neither too far away nor too far past stop bar</td>
<td>0.3</td>
<td>-1.7</td>
<td></td>
</tr>
<tr>
<td>make stops at intersections completely, i.e. came to 0 mph</td>
<td>2.6</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td><strong>C.5 Composite Vision Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Means ±SD</strong></td>
<td>VRDT</td>
<td>Controls</td>
<td></td>
</tr>
<tr>
<td>How well did the driver ….</td>
<td>5.9 ±3.1</td>
<td>1.2 ±2.3</td>
<td></td>
</tr>
<tr>
<td>visually focus 20 seconds ahead of car</td>
<td>2.3</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>visually focus on appropriate objects/potential threats</td>
<td>2.3</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>visually was inattentive, i.e. eyes off the road</td>
<td>2.6</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>appropriate use of mirrors, i.e. periodically checking mirrors</td>
<td>1.3</td>
<td>-2.3</td>
<td></td>
</tr>
</tbody>
</table>
parallel the actual on-road course, and (4) the on-road examiner was blind to the two study groups, it is impressive that participants receiving VRDT performed significantly better on all variables under study while driving on road. These independent findings were affirmed by participants' ratings of the VRDT usefulness, which could reflect the high fidelity / realism of the simulator. It is, however, important to note that the worst performance of the VRDT participants involved use of rear view mirrors. This may be due to inadequate instruction to use mirrors, or a reflection of the low fidelity mirrors. While side and rear view mirror images were generated and projected on the screen, these images were not in their typical location on physical surfaces 18-24 inches in front of driver's eyes. However, the newest version of the Model T3 does use LCD monitors.

### C.6 Composite Attention Variables

<table>
<thead>
<tr>
<th>How was the driver’s attention to....</th>
<th>VRDT</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>speed limits</td>
<td>5.3  ±2.2</td>
<td>3.3 ±2.4</td>
</tr>
<tr>
<td>stop signals</td>
<td>2.2</td>
<td>-0.1</td>
</tr>
<tr>
<td>side traffic</td>
<td>2.4</td>
<td>1.1</td>
</tr>
<tr>
<td>rear traffic</td>
<td>2.3</td>
<td>1.1</td>
</tr>
</tbody>
</table>

### C.7 Composite Attitude Variables

<table>
<thead>
<tr>
<th>How was the driver’s attitude toward....</th>
<th>VRDT</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appreciation for the potential dangers of driving, e.g. “How dangerous is driving?”</td>
<td>2.8</td>
<td>1.0</td>
</tr>
<tr>
<td>Appreciation for their driving skills, e.g. “How good of a driver do you think you are?”</td>
<td>0.9</td>
<td>-0.4</td>
</tr>
<tr>
<td>Appreciation for the need to drive defensively, e.g. “Even if you follow the rules of the road, is it your responsibility to be attentive to other drivers who are not following the rules of the road?”</td>
<td>3.0</td>
<td>2.8</td>
</tr>
</tbody>
</table>

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(from page 23)
Located in positions similar to rear and side view mirrors.

It is of interest to note that the VRDT protocol could not be replicated in the real world. That is, it would not be safe for the driver to focus exclusively on mastering lane position while ignoring other elements of driving when negotiating actual roads, with traffic, road signs and other obstacles to negotiate. In virtual reality, there is the opportunity to master one driving skill at a time, and then combine that skill with other skills in an additive manner in a controlled and safe sequence.

There are limitations to this study that should be noted. There was no placebo condition, where driving training time was controlled. An alternative design would be to have control subjects play video driving games, or read driving instruction manuals for two hours. Additionally, this study looked at the impact of VRDT in the short term, 2-4 days after concluding training. There is no data on whether the effects of this training would persist beyond initial on-road training.

While the effects of VRDT may have been enhanced if a professional driving trainer were used, more varied and extensive driving scenarios were used, a more realistic driving simulator with an acceleration base and more realistic mirrors were used, these pilot data are sufficiently impressive to justify further investigation into the benefits of virtual reality driving training, and to determine whether it should be used in driver education to the extent that virtual reality training is employed in the aviation industry or the military. A final cautionary note is that these results can not be extrapolated to all “driving simulators” but only to the immersive Model T³, its scenarios and the above described training protocol.

REFERENCES

Wallner, D., Hunt, E., & Knapp, D. . The transfer of spatial knowledge in virtual environment training presence. Teleoperators and Virtual Environments, 1998;7(2), 129-143

Driver education is front and center in the larger transportation community and becoming more so on Main Street USA. It is important that driver educators and driver education administrators are part of the discussions. USA Today says “Driver’s Education set for revival in public schools” (9/29/09)

Whether you choose to attend or not, you should also be aware that the Transportation Research Board, on Saturday, January 9, 2010 will hold an all day human factors workshop on driver education.

Throwing the Baby Out with the Bathwater: Overhauling Driver Education (a Human Factors Workshop session) Saturday, January 09, 2010, 9:00 a.m.-6:00 p.m., Marriott Daniel V. McGehee, University of Iowa, presiding.

This workshop explores the challenges that driving education faces and offers key assessment areas on potential opportunities for beginning a new model in driver training. Discussion topics will include national standards, parent involvement, simulation and virtual worlds, in-vehicle technology, instructor training and motivation, and outcome assessment.

Point to http://pressamp.trb.org/conferences/programs/session.asp?event=508&session=16850 for additional information on this pre-conference session.

A Matter of Perspective

A man was being tailgated by a stressed out woman on a busy boulevard. Suddenly, the light turned yellow, just in front of him. He did the right thing, stopping at the crosswalk, even though he could have beaten the red light by accelerating through the intersection.

The tailgating woman was furious and honked her horn, screaming in frustration, as she missed her chance to get through the intersection, dropping her cell phone and makeup. As she was still in mid-rant, she heard a tap on her window and looked up into the face of a very serious police officer. The officer ordered her to exit her car with her hands up.

He took her to the police station where she was searched, fingerprinted, photographed, and placed in a holding cell. After a couple of hours, a policeman approached the cell and opened the door. She was escorted back to the booking desk where the arresting officer was waiting with her personal effects.

He said, 'I'm very sorry for this mistake. You see, I pulled up behind your car while you were blowing your horn, flipping off the guy in front of you, and cussing a blue streak at him.' I noticed the 'What Would Jesus Do' bumper sticker, the ‘Choose Life' license plate holder, the ‘Follow Me to Sunday-School' bumper sticker, and the chrome-plated Christian fish emblem on the trunk; naturally...I assumed you had stolen the car.'
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