

AutoTeacher News & AIPC News

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You Teach, Why do Students not Learn? Part 5

Teach experience. Sounds strange, doesn't it? All information, knowledge, and understanding comes from experience. Experience in the classroom, experience in the shop, experience in some form or other. In the academic world, experience is defined as being told information typically in the form of a lecture. In the automotive training program, experience is a combination of hands-on and classroom.

The sole purpose of education and/or training is to advance the "experience age" of the student. In other words, to create educational experiences for the student that without the teacher's help might require years of random experiences. For example, if someone tried to learn the effective use of a multimeter without any instruction, reading books, etc. it would probably take a long time, if ever. The teacher can create a group of learning experiences that guide the student to effectively use the multimeter in a much shorter time. The better the design of the learning experiences, the shorter the required experience time to reach the goal.

Everyone has met people who possess much more information, knowledge, and understanding about a particular subject than only their age would indicate. How did this happen? One factor is, they have been exposed to (experienced) many more learning events than other people. Many times they chose to participate in those events and, in some cases, have actually even caused them. How unusual is it to see an automotive technician who, on his/her own time, works with a scan tool and a vehicle to enhance their understanding? He/she is taking an active role in increasing their "experience age".

The amount of information, skill, and understanding that is required to service present day vehicles has expanded dramatically from that required only 20 years ago. Yet the amount of time allocated to teach the subject is essentially the same as it was in the 1980s. This is one of the most common refrains about the NATEF task list; "We don't have time to teach all those tasks". What does an instructor do?

First, you must identify the skill level you need to teach. This is determined primarily by the level of your educational program. If you are a secondary program, you should have a lower performance level goal than a post-secondary program. This is the major point of confusion concerning the NATEF standards and task list. No one including NATEF expects a secondary program to graduate a Master Technician. If you are attempting that, you are doing a disservice to your

students and your program. Remember, you can not teach brain surgery to a student who has not passed a course in anatomy.

Second, you have to become much more efficient in your teaching processes. NATEF has spent a tremendous amount of time in developing their Task Lists. Considering all of the problems and the scope of the project, they have done an excellent job. But, you must correctly interpret some of their statements. For example, let's take a task from the Brakes list: Remove, clean, and inspect pads and retaining hardware; determine necessary action. The key phrase "**determine necessary action**" by NATEF definition means: "Indicates that the diagnostic routine(s) is the primary emphasis of a task. The student is required to perform the diagnostic steps and communicate the diagnostic outcomes and corrective actions required addressing the concern or problem. The training program determines the communication method (worksheet, test, verbal communication, or other means deemed appropriate) and **whether the corrective procedures for these tasks are actually performed.**" We have to give the folks at NATEF credit. They understood that there were some time concerns in accomplishing all of these tasks and therefore they decided that for some tasks, analysis was more important than the remedial process. I intend to discuss the NATEF task list and its application to the various levels of education/training in future articles. It is my goal to clear up some of the massive confusion that exists or to at least cause instructors and advisory committees to think about how the task list is being applied to their programs.

ATech's primary goal in creating its Troubleshooting Training series of products was to improve efficiency and increase the student's "experience age" as quickly as possible. There are many products in the series, but I want to focus on the 2815 - Starter, Battery, and Tester troubleshooting. Everyone knows how to troubleshoot a simple starter circuit, right? But how does a teacher create 47 faults quickly that will truly challenge not only students but even advanced technicians? Everything from rusty chassis connections to "chattering" relays are included. Need to evaluate the battery in the 2815 vehicle? A battery load tester is included in the software! It is connected using the same procedure as on the vehicle and allows adjust-



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You Teach, Why do Students not Learn? Part 5 cont'd



Figure 3

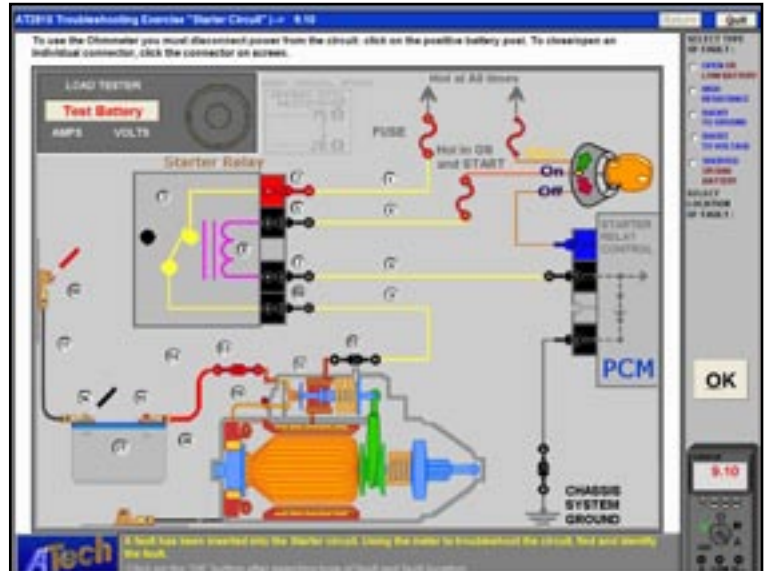


Figure 5

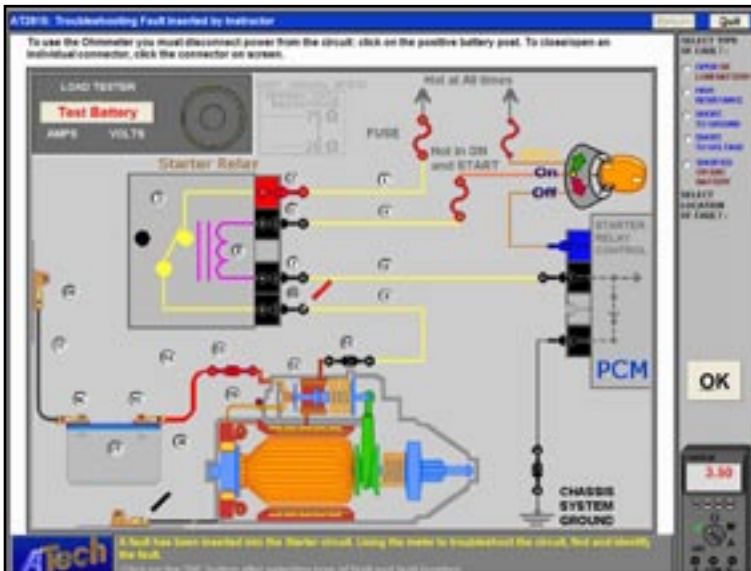


Figure 4

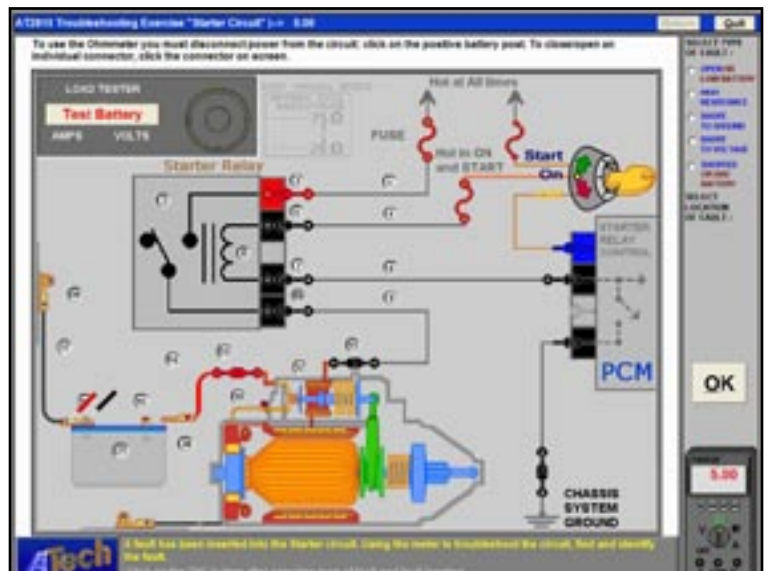


Figure 6

Want to cause the student to apply logic, mathematics and Ohm's Law?

1. Have the student calculate why the meter reads 1.15 volts in figure 2.
2. Ask the student to do the same calculation as in question 1 but do not use the current value. Hint - it has something to do with 1/11.
3. Perform the same calculations with the voltage measured in figure 4.

Remember this is the "training" level. The "advanced" level is still ahead. Forty seven faults in "training" level and forty seven faults in "advanced" level. Ninety four faults total!

Is understanding these circuits important? There is a major trucking company which gave up on their technicians troubleshooting starting and charging circuits. They found it less expensive to have them replace everything when there was a problem! The tech's "troubleshooting" took large amounts of time and then they replaced everything anyway!

Starter circuits are simple, right?

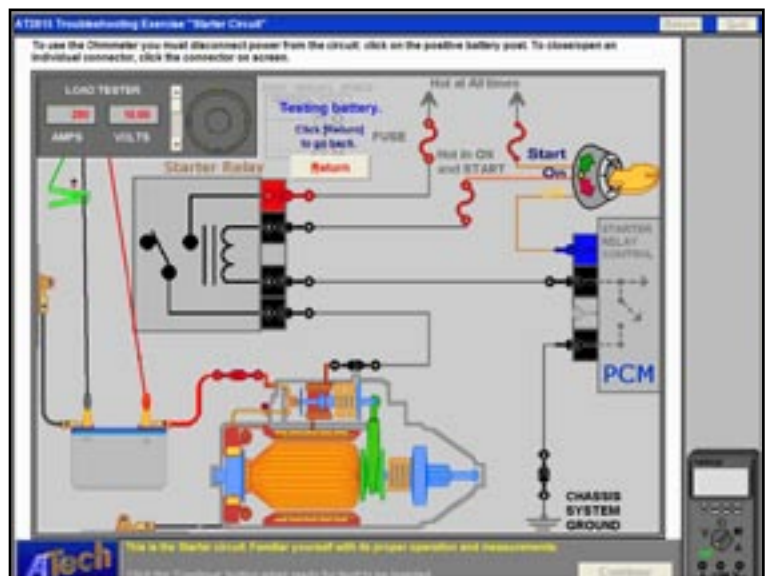


Figure 7

NATEF, Do We Really Need It?

What does it take to make a good automotive program? This is a question that we hear either directly or indirectly often. It is no wonder this is the number one question of new teachers, and administrators. We see today that new teachers are coming from the ranks of technicians. Administrators are being promoted from other positions in the schools system that often do not have any relevance to career and technical education. Career and technical education, especially automotive, has some very unique needs and requirements that you just don't see in other discipline areas.

The good news is that there is a guide that we can follow that is tried and true. It is called National Automotive Technicians Education Foundation (NATEF) certification standards. For Automotive Service Technician there are 10 standards that you can follow to create the automotive training program that your students deserve.

There was a day when automotive teachers would have to have a teaching degree from an accredited university. During the experience you would have to go through all the steps to plan an automotive program from scratch. This would cover everything from a task analysis, to developing performance objectives, choosing a text book, designing a shop and classroom facility, developing an equipment and tool list, writing lesson plans, setting up and conducting evaluations, and establishing an advisory committee. They would also learn about various ways to present information, manage hands on activities, coach learners one on one, and manage the program as if it were a business. Often teachers would work their way through college practicing their trade. When they were done with the course of study, they would have a pretty good idea of what to do in creating a program or moving into one that already exists.

It was also true that those who administered such programs came from a similar background and preparation. A vocational director, career center principal, community college department chairman, dean or director got to that position based on their experience in career and technical or vocational education. Those that were not qualified simply did not get into these positions.

In the 21st century, all that has changed. There are not very many universities that have specific teacher preparation programs for automotive technology or career and technical educators in general. As a result there is not a steady supply of teachers or administrators coming into the field. Technicians are becoming teachers when they have passed their prime repairing cars for a living. Administrators are being promoted from positions in elementary schools, middle schools, and comprehensive high schools. Deans and directors are getting added job responsibilities on top of their jobs as heads of liberal arts and allied health studies.

None of it is fair. It is not fair to the technician turned teacher. They come into a program armed with nothing but their memory of what it was like for them when they were in school.

In some cases they are thrown into the very same program they came from 30 years earlier. It has not changed in any aspect. In some cases, they never had automotive training in high school or post secondary school. They took all their training in OEM seminars and classes. It is not fair to the administrator to get thrust into a situation to manage a course of study they know nothing about, manage a shop and facility and business function they know nothing about, and students that are not the typical English or math student. Most of all it is not fair to the student. They deserve to learn tangible skills that they can use to get a job or learn how to take care of their automobile investment or save money by doing some work themselves.

Let's get back to the question at hand. The 10 standards that are spelled out in the NATEF guideline will surely get you started on the right track. They are all important and necessary to a quality program. But there are some things that you need to learn and to master that are not part of the standards. I would suggest that you start by going to www.natef.org and the certification process button. This will give you a multitude of background information and data. Take a look at the standards document and the application. You may even decide you want to have your program become NATEF certified.

You can download the standards document and keep it to study. Pay particular attention to the task list and the equipment list. For many, these two lists are the heart and soul of the program. It of course takes a large commitment of everyone involved to build a program to this standard. It takes a great deal of time, planning, coordination, cooperation, industry involvement, and money to bring it about.

Once you have had a chance to study the standards, task list, and equipment list, the future discussions will make much more sense. In the next issues of the news letter, we will be talking more about "what does it take to make a good automotive program". In fact, we will leave good in the dust and shoot for making a great program.

Gene Brown, ATech Vice President



ATech Donations

For your program to be considered for donations and special pricing on refurbished equipment, an application must be on file with ATech Training Inc. The application can be downloaded for the ATech website.

www.atechtraining.com

AIPC Annual Awards Program

To be entered in the 2006 AIPC Awards Program, an application must be received by AIPC postmarked no later than June 30, 2006. Details are included in the application which can be downloaded from the AIPC website.

www.autoipc.com

“How Comes?”

How Come #1?

If you can have electrically heated seats, steering wheels, mirrors, and rear windows, why can't you have electrical heat when you start your vehicle on those cold winter days. Think how great it would be to jump in your vehicle when it is 0 degrees, start the engine and instantly have hot air to clear the windshield. No more waiting 10 to 15 minutes while the vehicle warms up. No more wasted fuel. Less pollution. Some people start their vehicle 3 or 4 times a day and let it idle for 15 minutes each time just so it's warm when they get in. Maybe we should start a National group project to build our own. Sounds like a good project for an advanced student!

How Come #2?

How can the government mandate useless ideas like a third taillight and not have simple safety systems? General Motors can produce On-Star but can not design a simple RF system for warning of road hazards or wrecks during fog or rain conditions? By the time the OEMs get their product designed it will, no doubt, be gadgety, unreliable and a service nightmare. How many more people will have lost their life or be terribly handicapped? How much more property damage will occur. All for the lack of a \$5.00 warning system. We could probably build one of those too!

How Come #3?

The various manufacturers have been developing, for many years, complex radar/ultrasonic systems to detect vehicles in blind spots. How many lives would have been saved and how much damage would have been prevented if only the Government had mandated convex mirrors on side mirrors? A little 1.5 inch mirror that costs 50 cents. Most people get familiar with them and learn to effectively use them in a couple of weeks.

www.atechtraining.com

Instructor's Questions

What are Silver Bullets?

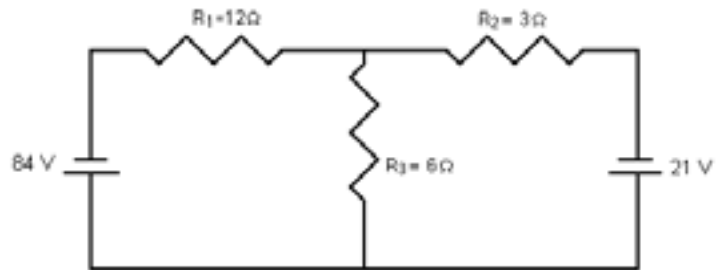
Silver bullets might be referred to as the independent repair industry's Technical Service Bulletins (TSB). Typically, they offer repair tips and tidbits of little known knowledge. An example from a few years back is the fact, “if you disconnect the TPS, you could determine the continuity of the PCM feed wire by measuring the voltage on the supply wire”. This statement seemed very profound to those automotive technicians who were unfamiliar with standard voltage divider sensor circuits.

Silver bullets have their place especially considering the quality of service information being provided. But, they are no substitute for knowledge and understanding. If they were, no aspiring technician would need to attend school or training programs. They could just consult their Silver Bullet book.

What is Kirchoff's Law?

It is common to hear automotive instructors at all levels, public, after market, and OEM talk about Kirchoff's Law. There are actually two main laws stated by Mr. Kirchoff. One is that the voltage drops around a closed circuit must equal the supply voltage. The other is that the sum of currents entering a circuit node must equal the sum of currents leaving. While these statements seem to be common sense, they are the source of many very useful “theorems”. For example, Thevenin's, Norton's, Superposition, and Millmans.

If you truly understand Kirchoff's Laws, you will be able to determine the amount of current flow through R3 in the circuit below.



ATech Training's “Top Gun” Award



General Motors S.E.T. Program

Imitation is the sincerest form of flattery. ATech is extremely flattered as this program has been imitated by 5 different companies. If you can't have an original idea, check ATech to determine where the industry is going!

ATech was involved with the design and manufacturing of the electricity and electronic trainers currently used by General Motors, DaimlerChrysler, Ford, Nissan, and Bosch.



GM "Specialized Electronic Training"(S.E.T.) Program - Model 18002TR

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GM Service
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 - Current Measurements
 - Experiment Schematics
 - Simulated Component Operations

Automotive Industry Planning Council (AIPC)

The following letter was sent to Mary and the members of AIPC. There have been many discussions over the years among the members about the effectiveness of AIPC. This illustrates that the prizes we award are only a small part of what a program wins when they succeed at any level - National or State. The 2006 application is on the website for download now.

www.autoipc.org



A handwritten signature in black ink that reads "Fred Hines". The signature is fluid and cursive, written over a light-colored background.

To: Mary Hutchinson
NATEF Executive Director
AIPC Executive Secretary

January 20, 2006

Dear Mary,

Please forward this to the members of the Automotive Industry Planning Council.

It has been a little over 1 year since my Automotive Program at the Warwick Area Career & Technical Center (Rhode Island) won the prestigious Automotive Industry Planning Council (AIPC) Award for excellence in the secondary category (2004). I thought that the council might like to know what has been happened here in Warwick since they chose my program as the #1 Secondary Program in the USA.

After traveling to Las Vegas (my first time) to receive the award at the ACTE conference, I was able to use the \$10,000 Snap-On grant prize donated by ASE to purchase a R-134 Refrigerant machine and a Transmission Fluid Exchange machine. These two pieces of equipment allow us to once again improve our program. The R-134 Machine was the last thing we needed to obtain NATEF certification in the HVAC area when re-certify in 2 years.

The school also received a 2004 Dodge Durango and a 2004 Acura MDX for training purposes. These vehicles join our fleet of (now) 8 late model vehicles which allow our students to train on modern technology.

In February 2005, I was invited by NATEF to attend the 3 year NATEF Standards revision workshop held in Alpharetta, Georgia. This was an excellent experience and I was able to network with many leaders in the automotive Industry, and provide input to the new standards!

February and March bring the Rhode Island Auto Dealers Contest and Skills USA state contests. Our students took 1st and 2nd in Skills USA, and 1st and 4th in the dealers contest. During May we took 1st & 2nd in the State Ford / AAA contest, also winning the high school

State written exam award.

In April our two contestants who won the dealers contest traveled to NY for the nationals where they took 5th place. In June our Gold medal state Skills USA student (John Washburn) went to Kansas City and won the NATIONAL GOLD MEDAL as the #1 Automotive Technology student in the USA! This was a first for Rhode Island.

John flew from Kansas City directly to Washington D.C. to meet me and his partner (Jason Marley) in the Ford / AAA national contest. John and Jason finished 11th overall, however they had the 2nd highest written test score on the ASE exam in the country!

The Career Center also graduated 12 automotive students in which 9 went on to post secondary automotive training, or directly into the field. In all, our seniors won just over \$400,000 in scholarships, tools, equipment etc.

Our budget has remained constant this year even though our city is in a budget crunch, and our reputation has only risen thanks to the AIPC award. Once again, thank you AIPC members, and I hope you enjoyed reading this!

David M. Tibbetts
Automotive Teacher
Warwick Area Career & Technical Center
Warwick, RI 02886 401-734-3164



L to R: Jason Marley-Warwick, David Tibbetts-Warwick
John Washburn-Warwick, James Dunst-Ford/AAA

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Download the 2006
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Automotive Industry Planning Council



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In this Issue:

- **You Teach, Why do Students not Learn? # 5** page 1 - 3
- **NATEF, Do We Really Need It?** page 4
Should it be discarded and everyone start over?
- **How Comes?** page 5
Common Sense Questions
- **A Tech Donations Application** page 5
Also special pricing on refurbished equipment
- **AIPC Awards Application** page 5
Application must be postmarked by June 30, 2006
- **Instructor's Questions** page 5
A Test of your knowledge of Kirchhoff's Laws
- **General Motors S.E.T. Program** page 6
The flattery continues
- **A Letter to the AIPC** page 7

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