



## **How PSSC Shaped My Teaching**

*by Dick Heckathorn*

PSSC Physics became a household word for me during an Academic Institute at Ohio State University in the fall of 1962 when I enrolled in a PSSC training course taught by Professor Riley. Saturday after Saturday, 22 teachers met to explore the program: reading the text, doing the problems, seeing the films, doing the investigations, exploring the resource materials and, most important, interacting with each other. A thorough understanding of the philosophy and arrangement of the course was the result. This prepared me to teach the program. In addition I obtained an understanding of how to instruct my students in an organized, thought-provoking way.

This also provided an awareness of important elements of any teacher workshop. For teachers to do a good job of leading student investigation, they must first do it themselves under the watchful eye of the instructor. A discussion must follow that provides an understanding of the concepts being investigated. Finally the teachers must be provided with a box containing the apparatus for use by the students in their classroom.

During the years that I taught the course, 1964-1988, I recommended the course to others. Almost all of the teachers who tried to teach the course went to something else the next year. The reason I believe is that they did not understand the philosophy of the course or how to teach it. Thus the ability to teach PSSC physics depended on the in-depth, detailed study of the course that I received before teaching it.

When I came to the Cleveland area to teach in the fall of 1963, Larry Badar informed me of the area PSSC meetings that were held twice yearly. As I attended meeting after meeting, I gained new insights from others how to better instruct my students. What a tremendous opportunity it was to network with so many who were doing the same thing, even without the internet. It was a sad day when the meetings ended. But some of us in the Cleveland area wanted meetings of physics teachers to continue. And they did with the end result being the formation of the Ohio Section of AAPT.

My school system was very supportive. With government funding for scientific equipment, they gave me nearly a blank check. I met with an area teacher to determine what equipment was needed. As we talked, an announcement came over the PA that President Kennedy had been shot.

My system was also supportive in that they scheduled the class for 90 minutes a day. This allowed me time -- things do take time -- to guide my students through the whole course, doing all the investigations, seeing the films and spending time discussing the material and problems. In so doing, I was able to share with my students the storyline of the program. The second year, the program grew to two sections. Students responded that they signed up not only because of peer recommendation but also because they would be doing investigations.

During the second year of teaching PSSC physics I began to get feedback from students who were in college. Every one said that they were way ahead of most fellow students in their knowledge of physics, ability to perform investigations, and their ability to solve



problems. They felt their processes and skills had been honed to the point that they could help others in their class.

For the first six years that I taught the course, my skills and abilities grew as I learned better ways of organizing and presenting the material. I again must state that the twice yearly PSSC meetings were a tremendous help.

During the 1970-1971 school year I had the opportunity to teach physics in a school near Liverpool, England. While there, many teachers asked me a question that I had not really focused on, “How do you teach physics and why do you teach the way you do?” This became a focus point of my thinking. As a result of this, I began to focus in greater detail on the how and why’s of teaching. This quickly led to focusing on how students learn. Quickly I sensed the fact that students were different, learned differently, and needed individualized instruction. My wife was a learning disabilities teacher and spoke often of Individualized Instruction Plans that she would write for each student. Should I also focus on the individual needs of my students?

A publication from the Center of Personalized Instruction, located at Georgetown University, titled “Study Guides for PSSC Physics” by Charles P. Friedman and James S. Strickland was given to me. This provided the impetus for writing a self-paced high school PSSC program for my students that I began using in the fall of 1972. I struggled during the year to keep ahead of the students. It was an immediate success. Students enjoyed working in groups of two to four. Every once in a while a student wanted to work on their own but they soon saw the need to be part of a group. About eighty percent of the time students worked in their own group. As they worked, I was available to assist when they wanted it. Some times were spent in a whole class setting to discuss common questions and presenting difficult information. As I look back on 47 years in education, I can truly say that teaching in this manner provided the most satisfying teaching experience as I was able to deal with individual student needs as they arose. But I admit I never worked harder. Each year I had to retype the material to include changes on those old, blue smelly ditto sheets. I think I would have burned out had it not been for the emergence of the computer in 1981. From that time on, one only needed to make changes and then print.

In the late 70’s before the 5<sup>th</sup> edition came out, I along with four other PSSC teachers, Don Iverson, Marie Penny, Tom Dillon and Robert Gardner were invited to Boston to meet with the authors, Uri Haber-Schaim, John Dodge, Jim Walter and Judthen Cross. So for two days we met at a resort on the Atlantic coast to provide our ideas and interact with them. What a privilege it was as I learned new ideas. I also understand the passion that drove the authors to develop and enhance the program. And as a bonus, the name of the five teachers appeared in the 5<sup>th</sup> edition of the text.

Some of you may remember from national AAPT meetings Uri’s passion for teaching physics first, then chemistry and finally biology. This idea was truly long before its time. You may also remember Uri’s involvement in a junior high program; Introductory Physical Science (IPS), which stressed investigating and developing concepts rather than learning from verbal instruction.



During the last year I taught PSSC physics, 1987-1988, my students struggled greatly as they tried to master the material. One reason for their struggle was that they were having trouble reading the text. They were also having difficulty doing the mathematics. Another was that their attention span had become shorter. This is in contrast to previous students. Trying to find the reason, I realized that this was the first group of students that had come through our middle school, grades 6-8. All their science and math teachers were trained and possessed an elementary teaching certificate. None had detailed training in math or science. In the Junior High arrangement of grades 7 and 8, their science and math teachers were teachers who had been trained in their disciplines. Also, in my opinion, the presence in every home of TV with its 12-minute segments reduced attention spans. I'm sure there were other reasons as well.

After much discussion with the curriculum superintendent and others, PSSC physics was removed from the high school curriculum. It was a sad time for me. As I taught the next year, I came to realize that it was time to retire (the first time). The excitement of working with the whole class was not the same as working with individuals.

I must say that it saddens my heart when I see a teacher with minimal physics training given a textbook and sent into the classroom to teach physics. But the advent of PTRA in 1985 brought an organized way to help physics teachers improve their skills. With God given talent and the PSSC training I had early in my teaching career, I was able to make physics come alive in my classroom.