

JIM STICE

of The University of Texas



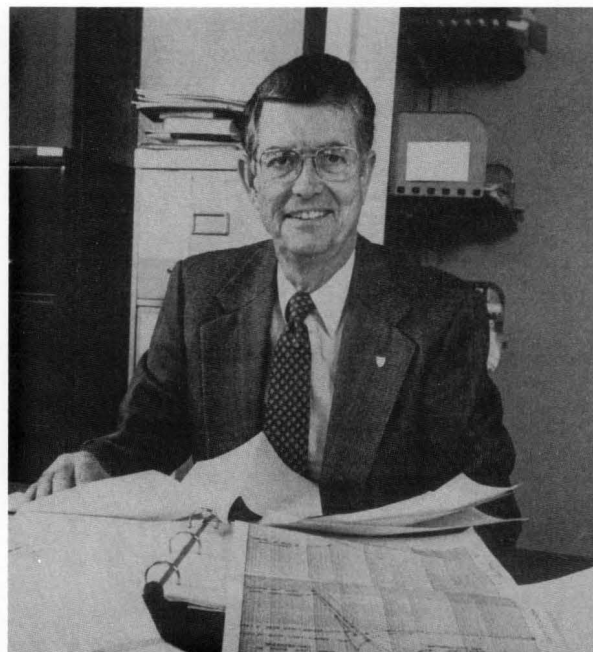
A practical problem intrigued the young professor, Jim Stice: How can we improve engineering teaching?

Just as most engineers would do, he began to create a simple, logical solution to the problem. Unpredictably, however, the problem and its solution went on to consume twenty-six years of his career.

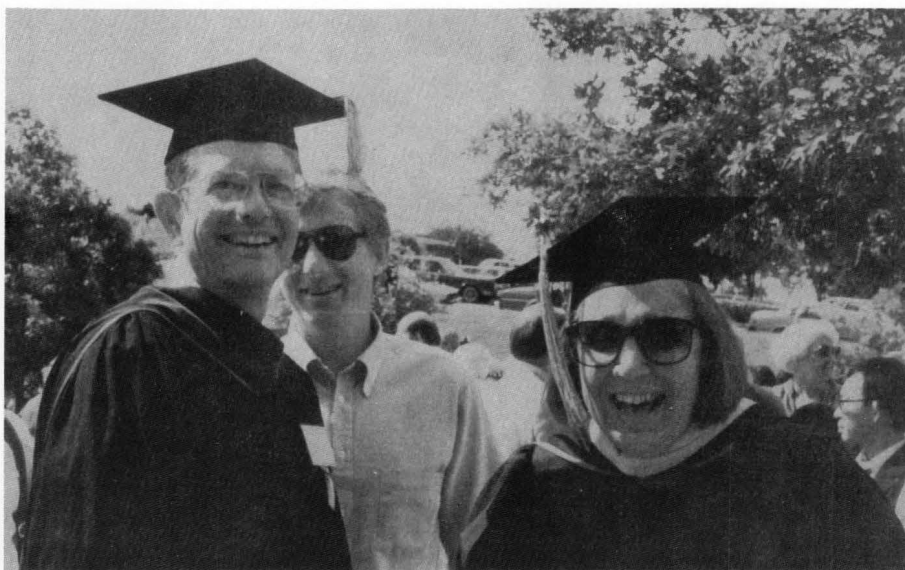
A leading authority on engineering teaching effectiveness today, his research began with a 1963 doctoral dissertation creating the first integrated approach to teaching automatic control. It grew into one of the nation's foremost centers of teaching effectiveness at the University of Texas-Austin, and Jim served as its director for sixteen years before returning to the classroom full time.

Jim had his first taste of teaching when, in his first industrial position, the technicians in his group asked him to give short courses in mathematics and chemistry during the noon hour. "I didn't really want to do it at first, but I felt I should, and before long I found that I enjoyed that session more than anything else in the day. It never occurred to me at that time, however, that I might eventually spend most of my professional life as a teacher."

Jim was born in Fayetteville, Arkansas . . . home of the



Transition of Stice the 11-year-old-boy (top) to Stice the full-fledged-professor.



Jim and his wife Patsy celebrate her graduation.

Arkansas Razorbacks. He has been a fan of both their football and basketball teams all his life, and he still remembers going to the games and passing out programs when he was a Cub Scout, and later when he was a Boy Scout. "You got into the games free and really only had to work about half an hour before you ran out of programs. It was the best deal in town!"

After graduating from high school, he enrolled at the University of Arkansas in the fall of 1945. "Spider" Stice intended to go to work in the chemical industry when he graduated four years

later, but only about a third of his class got offers, and he wasn't one of them. So he opted instead for graduate study at the Illinois Institute of Technology, partly because it was in the North and partly because he wanted to experience life in the big city. "But mostly, I went there because they offered me an Armour Research Foundation Fellowship," he adds.

While at IIT, Jim met another young student, Patricia Stroner, who stole his heart and who later became his wife.

After graduation he went into industry to seek his fame and fortune, and worked for a time for Visking Corporation, which was later bought by Johnson & Johnson. His only other industrial job was with the Thurston Chemical Company, which later became a division of W.R. Grace and Co. Jim contends that his employment with these two companies had absolutely nothing to do with their subsequent sale.

His industrial experience showed him that he could function well as a practicing engineer, but at the same time he found he was often bored with what he was doing. Then, an early-morning phone call changed his life. Dr. Maurice Barker, head of the chemical engineering department at the University of Arkansas, was calling to explain that the department had lost a professor and needed a last-minute replacement. He was hoping he could persuade Jim to take the job for a year, to help the department out of the hole it found itself in. He sweetened the pot by suggesting that during that year Jim could use the University Placement Office to look for an industrial opening that appealed to him.

"Here I was, someone who had never considered teaching as a career, becoming an assistant professor at the State University! Unbelievable. Then, even though I had never worked so hard in my life, I found that I really *liked* teaching, and I began considering it as a career track instead of industrial involvement." He returned to IIT, got his PhD., and returned to the University of Arkansas as associate professor in 1962.

For the next fourteen years Jim did all the things professors do to "get ahead," but he was always more challenged by, and found more satisfaction in, teaching than in research. Then in 1968, Johnny McKetta, Dean of Engineering at the University of Texas, offered him a job that would involve working with faculty members in the College of Engineering to help them improve their teaching skills. Jim ac-

cepted the position even though there was no other program like it in the country and as a result there were no precedents, no examples to follow. He was on his own.

Jim says that half the time he didn't know what he was doing, but that he certainly enjoyed doing it. Evidently his efforts were successful since the UT

Stice says, "These people spend a great deal of time and energy studying the elements of their disciplines, but little or no time learning how to communicate, to motivate, to convey information, insights, and ideas. . ."

Faculty Senate later decided there should be a similar office to serve the entire campus and that Stice should be the one to head it up. Thus, in 1973, the new Center for Teaching Effectiveness came into being, with Jim at its helm.

"I have always thought it strange that people who are hired to teach in a college or university are not expected to have any training or skills in teaching," Stice says. "These people spend a great deal of time and energy studying the elements of their disciplines, but little or no time learning how to communicate, to motivate, to convey information, insights, and ideas to others.

"I have tried to attack the problem in two ways. First, the University of Texas had an old rule that all graduate teaching assistants were supposed to *take a course* in 'supervised teaching.' I searched the campus over, however, and found only one such course out of sixty-eight departments! So I began teaching a course in the chemical engineering department in the summer of 1972 and persuaded several professors in other departments to sit in on it so they could eventually offer a similar course in their own discipline. Now we have such courses in about thirty departments, and most of them seem to be going well. If any of their students elect higher education as a career, they will be a lot better prepared than I was!

"Second, I tried to persuade various university administrators to let us provide a similar experience for new faculty members. No one showed any interest until Dr. Peter Flawn arrived. He allowed us to give it a try, and the program was quite successful. We now have a three-day seminar for all new faculty, regardless of rank, at which our own people give presentations on everything from writing instructional objectives to teaching creativity. The

President foots the bill for two free lunches, coffee breaks, an end-of-seminar Attitude Adjustment Workshop, and all the handout materials. Cost is around \$3,000. It would be a bargain at five times that price.

"We now have about 750 'graduates' of the program. Even if they don't use all the ideas that were presented to them, they are considerably more sophisticated about what they are trying to accomplish.

"In 1986, just before the beginning of the spring semester, we began a similar (two-day) program for

For . . . fourteen years Jim did all the things professors do to "get ahead," but he was always more challenged by, and found more satisfaction in, teaching than in research.

experienced faculty. The response both surprised and gratified us—attendance has been over 150 for each of the past three years! That kind of response demonstrates that many faculty members really *do* care about teaching and that they will readily participate in a program like this if it is available. Additionally, many of the attendees offer to give a presentation in the following session—there are more offers than we can accommodate. It is a self-renewing program, and it costs peanuts."

Stice's philosophy is simple—offer practical help that can be implemented immediately. "There are a lot of things we could use in our teaching if we knew about them. It's just that no one ever told us about them, and it's inefficient for us to discover them for ourselves," he says, and adds, "Teaching is an ancient, honorable, and extremely important profession. It can be tremendously satisfying. However, we are capable of doing it much better than we are now doing it, and I think 'educating' the faculty is the first step toward that goal."

Jim was one of the early engineering educators who investigated the possibilities of using the digital computer in computer-aided instruction. Somewhat later he became aware of Fred Keller's work with the Personalized System of Instruction (PSI), also known as the Keller Plan. With the aid of a grant from the Alfred P. Sloan Foundation, he and a group of faculty members developed nineteen PSI classes and compared student performance in them with that of students in conventional classes in the same subjects. They concluded that, in most cases, the PSI

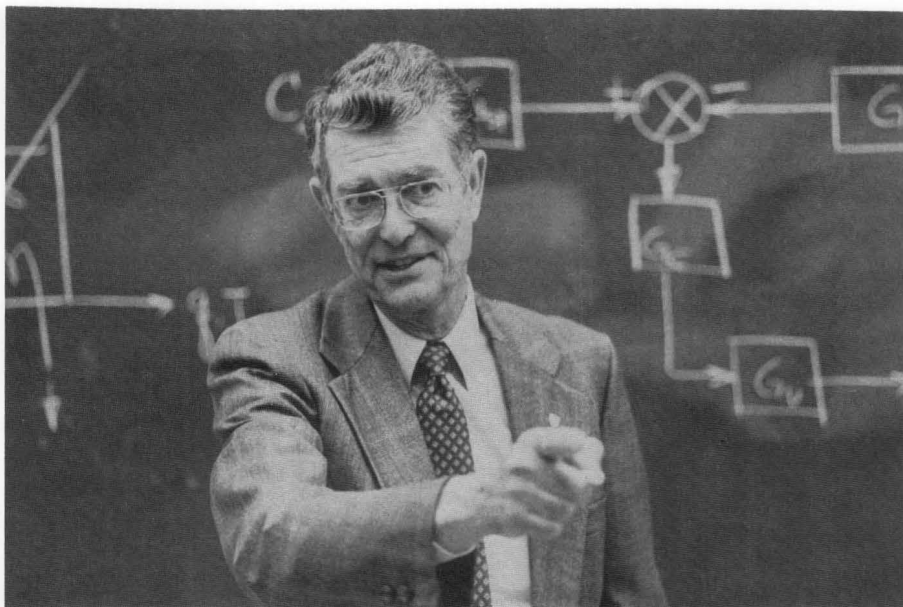
students learned more and remembered it longer.

Another innovation was the Student Input Project (SIP), funded by the Exxon Education Foundation. It established that periodic meetings between faculty members and designated members of a class, throughout the course, resulted in better satisfaction with the class by both students and instructor. It also furnished the instructor with useful feedback and allowed changes to be made in class organization, structure, or procedures while the class was still in progress. "This method was more useful than the more conventional end-of-course evaluation where suggestions were received too late to be incorporated into the course."

In the 1980s, Jim became interested in efforts to teach problem solving—particularly the work of Lois Greenfield (at the University of Chicago), Don Woods and his colleagues (at McMaster University), and Art Whimbey and Jack Lochhead (at the University of Massachusetts). All these teachers used pairs of students to discuss problem comprehension, analysis of elements, formulation of a plan, its solution, and evaluation of the solution.

"When I was an undergraduate student," Jim says, "I was a memorizer. I could do things that I had done before, but when a teacher gave us a new or different situation, I was stumped. This caused some problems in my junior and senior years...but it was potentially disastrous in graduate school where the tests routinely dealt with things we had not specifically covered in class. What they were trying to do, of course, was teach us to think. (I viewed it, however, as a dirty plot to flunk us out.) If it hadn't been for one of my roommates, who undertook to show me how to analyze, I may have become a victim of that imagined plot. After several weeks I began to see that there was a strategy to this business, and my work started to improve. It was almost thirty years later that I realized that my roommate had been doing pairs-learning with me!"

Lately Jim has become interested in learning/teaching styles. He says, "For a good many years after I started teaching, I guess I thought that most of my students learned things the same way I had learned them. But then I heard about the Canfield profile, and later the Kolb learning-style inventory, and a whole new way of looking at the learning process opened up for me. I began to realize that while some students could learn readily from Professor X, others in the same class found him puzzling, disorganized, and difficult: some students



"Teaching is an ancient, honorable, and extremely important profession. It can be tremendously satisfying....If I had it all to do over again, I would try to do about the same things..."

wanted details while others preferred a global approach; some loved everything about a course while others were bored out of their skulls (and a few of the latter changed majors as a result).

"Discovering the difference in learning styles has made me think hard about the way I handle my own courses. As a result, I have changed the way I do some things in order to reach more of the students, and the result has been greater satisfaction for both the students and myself."

Together with Rich Felder and Rebecca Leonard of North Carolina State University, Stice has a new project: a three-day National Effective Teaching Institute (NETI) for engineering and engineering technology instructors. It will be held just prior to the 1991 and 1992 annual conferences of ASEE, and its goals are to

- improve the teaching effectiveness of the individuals participating, and
- provide an outline for courses in college teaching for graduate teaching assistants.

Participants will not have to pay any fees for the NETI—registration, coffee breaks, luncheons, and all handout materials will be provided free of charge. Participants' deans will have to nominate them and agree to pay for their transportation, hotel, and miscellaneous expenses. DuPont, Union Carbide, and Dow Chemical have already signed up as sponsors for the institute. More information and details about applying will appear in *Engineering Education* prior to the conference.

Jim has been a member of ASEE since 1962 and

is an active participant in both the Chemical Engineering and the Educational and Research Methods Divisions of that organization. He has held numerous offices, including Chairman of the Chemical Engineering Division, and is currently Chairman of Professional Interest Council (PIC) 1 and a member of the ASEE Board of Directors. He has also been a member of the American Institute of Chemical Engineers for thirty years.

Stice was named T. Brockett Hudson Professor of Chemical Engineering in 1985, and Bob R. Dorsey Professor of Engineering in 1990. He may be the only professor on the UT campus who holds a named chair because of his *teaching* activities rather than his research—certainly, he is the only one in the College of Engineering. When asked about this, he said, "It surely would have been easier to go the conventional route and get research funding, support graduate students, write technical articles, and all the rest of it. Colleagues, although they are willing to let everyone do their own thing, still do not value research and publication on questions pertaining to engineering *education* as much as they value regular research. So I have had to develop a thick skin and stay pretty fast on my feet. But I really believe administrators are willing to provide encouragement to people who are sincerely interested in good teaching.

"Teaching can be tremendously satisfying. If I had it all to do over again, I guess I would try to do the same things again. I have had a lot of luck, have met some really great people, and have had a bunch of fun along the way. And the students make the whole show worthwhile." □