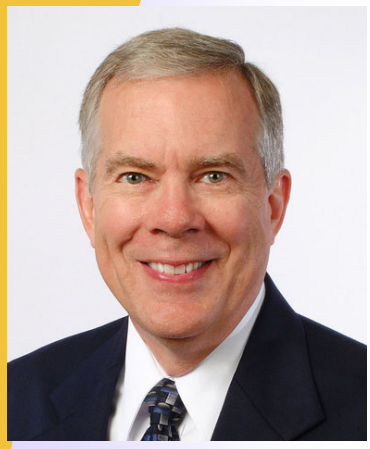
College of Engineering
Department of
Mechanical & Industrial Engineering

The Dr. Robert W. Courter Seminar Series



3:00-4:00pm, Friday, October 25th, 2024
1206 Patrick F. Taylor Hall

Learn to Think Like an Expert

by David C. Wisler*

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GE Aviation (GE Aircraft Engines), retired

Notice that the title reads learn to think like an expert not be an expert, although the latter is sound advice also. I concentrate this presentation on learning to think like an expert because cultivating this skill is the path to becoming an expert. It will reap vast rewards in the future. Understanding expertise and how experts differ from novices in seeing, storing, retrieving and using information provides insight into the nature of thinking and problem solving. It shows what successful learning looks like. Expertise is much more than simply having a lot of knowledge about a subject. Experts have a well-organized structure for storing and recalling knowledge that affects what they notice, how they organize new knowledge and how they interpret information. This in turn affects their ability to remember, reason and solve problems.

Unfortunately, students are rarely taught the skills needed to reason and think critically like an expert would think. Too often they then fall into the practice of memorizing formulas and procedures for examinations, searching for a computer program to use and then 'plugging and chugging' for solutions.

Without logical connections between what is being memorized, the information is almost always lost in a few days or weeks as the student moves to the next course or the engineer/researcher moves to the next project. This conditions one to be a novice.

Having participated in many design projects, design boards, and project creation and analysis meetings, I've seen 'thinking like an expert' put into action even by engineers and researchers evaluating complex problems that are not in their direct field of expertise.

This seminar provides insights for students to develop the skill to think like an expert.

* Dr. Wisler's distinguished career at GE Aviation spanned 40-years, during which he conducted and managed advanced technology programs. He is recognized as an international expert in turbomachinery aerodynamics technology. His work to improve airfoil shapes and understand the complex flow fields in the rotating components of gas turbine engines is instrumental in reducing loses (reducing fuel burn) and improving performance. After retiring from GE, Dr. Wisler joined the MIT CDIO Initiative to revitalize engineering education worldwide. He is currently a Subject Matter Expert in gas turbine engines for the Office of Naval Research. He is:

- A member of the US National Academy of Engineering
- Elected to the GE Aviation Hall of Fame
- A past Sr. Vice-President and a Life Fellow of the American Society of Mechanical Engineers (ASME), past Editor of the ASME Journal of Turbomachinery and the Journal of Engineering for Gas Turbines and Power
- An Associate Fellow of the American Institute of Aeronautics and Astronautics
- The only three-time winner of ASME's Melville Medal (best paper in all 20 ASME technical divisions), winner of two IGTI Gas Turbine Awards for best paper of the year, ASME's Aircraft Engine Technology Award and the R. Tom Sawyer Award.