



# INNOVATION ABSTRACTS

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## PREPARING STUDENTS FOR TECHNICAL CAREERS

Preparing students for real-world technical careers in an educational environment can be a challenging task, but not impossible. In addition to the theoretical material, the instructor should focus on specific skills that students need to acquire and give assignments and exams that help them develop these skills.

- Give take-home and in-class exams; they each develop skills that are needed in a technical career. Take-home exams develop the in-depth analysis skills that help solve real-world problems. Giving students a few days to think about a problem will more closely approximate how real technical design work is done—e.g., problems are often solved while driving the car or eating lunch. In-class exams develop quick thinking under pressure, important skills when discussing ideas in meetings with colleagues or customers. They are also the only way to test that students know the material and are not passing off another student's hard work as their own.

- Assign practical problems that include design decisions. Take a textbook problem requiring a simple calculation, and ask students to determine how changing the different parameters will affect it. Assign open-ended problems for which there is no single correct answer. Ask students to justify their decisions and to describe the effect of each parameter on the final results. Requiring students to give qualitative explanations that accompany the quantitative answers will develop analysis skills and identify any misconceptions they may have regarding the theory. Give problems for which students must look up information in handbooks and manufacturers' catalogs. Interpreting and using information from tables and graphs are important parts of many technical jobs.

- Give individual and group assignments. While the importance of teamwork in technical fields is indisputable, most who have participated in on-the-job team-building exercises agree that they can be contrived and less than effective. The classroom, however, can be an

ideal place to develop teamwork skills using group assignments. The product (i.e., the assignment and the grade) is important to the participants. Be sure that everyone has a role and that one or two members do not dominate a team. (This is one real-world phenomenon that should be avoided for the sake of all students.) Individual assignments should be made, as well; they develop a deeper understanding of the material, self-reliance, and confidence.

- Help students develop communication skills by giving assignments that require verbal and written communication. An idea that cannot be communicated will likely not be implemented, and anyone who cannot communicate effectively will have a difficult time being promoted, even if capable of doing the job. A good start to helping students learn these skills is to set an example by communicating clearly during lectures, about assignments, and on exams. Create classroom materials well ahead of time to allow for proofreading, and always work out problems ahead of time to be sure that the wording is clear and all the information is provided. Have students submit formal reports in which good technical writing and correct terminology are expected. Encourage them to read technical magazines and journals within their discipline. They will not only learn technical information but be exposed to good technical writing. And, finally, explicitly express the importance of good communication skills to your students and explain how the skills will help their careers.

The keys to skill development are being aware of the skills that students will need on the job and looking for ways to develop them within the framework of your curriculum.

**James L. Johnson**, *Instructor, Engineering Technologies Division*

For further information, contact the author at Lorain County Community College, 1005 North Abbe Road, Elyria, OH 44035. e-mail: [jjohnson@lorainccc.edu](mailto:jjohnson@lorainccc.edu)



## PSYCHOLOGY TRIVIA: PROMOTING INTRINSIC MOTIVATION IN PSYCHOLOGY COURSES

Intrinsic motivation has been described as a student's curiosity, persistence, and mastery of academia. Among educators, intrinsic motivation represents the "inner drive" that is essential to academic achievement. Research has suggested that students with high intrinsic motivation have higher grades, higher test scores, and frequent perceptions of academic competency. On the other hand, low intrinsic motivation has been associated with poor academic progress, poor school attendance, and poor career choices. According to the person-environment fit theory, low intrinsic motivation is due to a "mismatch" in the student's need for autonomy and school resources. In other words, as educational institutions provide more opportunities for self-determination and self-exploration, students are more likely to be successful.

Each semester, I have explored various teaching strategies that promote intrinsic motivation. This semester, I created Psychology Trivia, an online extra-credit project that is connected to the college's electronic library and accessible to students at home or work. Our librarians offer a 30-minute presentation on Psychology Trivia and various online databases to help orient students to accessing information in this format.

Psychology Trivia consists of 30 multiple-choice questions based on information covered in class. Each question contains a hint which assists students in identifying the answer. Game rules provide detailed instructions on how and when to complete the game.

In the beginning, Psychology Trivia was designed to promote intrinsic motivation for psychological concepts and theories. However, I have found it also provides opportunities for students to participate in cooperative learning experiences, computer applications, and library activities.

**Donald S. Chandler Jr.**, *Visiting Scholar, Psychology*

For further information, contact the author at El Centro College, Main and Lamar Streets, Dallas, TX 75202.  
e-mail: dsc5476@dcccd.edu

*Suanne D. Roueche, Editor*

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