

## “Mr. Quiz”

Capt Christopher Augeri, DFCS

I have found it challenging to consistently integrate active learning activities into my computer science classes. Although it is reasonable to limit active learning only to certain key exercises over the semester, the real goal is to have students and the instructor actively engaged every lesson. Towards this end, I have developed a tool called “Mr. Quiz.” The tool is based on my perception of the learning process: acquisition of basic knowledge leads to knowledge integration. Further, because the tool has many gaming aspects, I find that it builds teamwork and encourages integration with others.

Knowledge integration is an internal process when cadets make connections across an interdisciplinary body of knowledge. It can only occur after cadets have acquired basic facts and concepts. This tool, “Mr. Quiz,” targets foundational knowledge in the discipline. In other words, over the course of the semester, I expect cadets to learn basic terms, concepts, formulae, relationships, etc. I want them to know these not only during my semester course, but also later when this foundational knowledge is relevant to their chosen discipline.

The tool itself is really quite simple. I first frame some critical questions based on each day’s material and then add some review questions over past material in order to reinforce it. The software pulses rapidly through the roster of cadets, flashing their names on a screen. The program randomly chooses a cadet, who then selects a question as the day’s series flashes rapidly across the screen. Ideally, the student is knowledgeable enough to answer the designated question. Otherwise, cadets are allowed one free “pass” during which they can either choose a new question or designate a classmate to

answer. I keep Mr. Quiz operating at a rapid-fire pace for up to ten minutes. This time period seems to work best because I can cover a broad range of questions before cadets tire of the game.

I am often asked how in-depth one can get with such a game. With proper phrasing, I find that I can frame questions that run through a full spectrum of the knowledge base. Some questions will emphasize rote material, but others present advanced concepts that can lead to lively discussions. For instance, in computer science, a rote knowledge question might be “How many bits are in a byte?” A more advanced question might be “What is the process of activating, or context-switching, a job on a central processing unit (CPU)?” A high-level question would be “What are the ethical issues related to copyright protection with digital media?” I have no difficulty using this tool across the entire learning hierarchy of knowledge, comprehension, and application in both our core computing class and the majors’ only computer architecture course.

The “Mr. Quiz” questions prompt lively verbal interaction amongst the class members and me. These exchanges, coupled with the “Am I next?” pressure, tend to increase cadets’ energy level and their motivation to know the material. The current version is done in Microsoft Excel, with plans to develop a separate executable, providing a more robust interface. In addition to the basic questions, I also throw some humor questions into the mix, such as “What is your favorite movie and why?” or “Who is the coolest cadet at the academy?” To emphasize teamwork and the fact that we are all in this together, I load my own name into the program, adding elements of risk and fun.