

## Student Response Devices and Online Homework to Support Geoscience Student Success in Traditional Lectures, Distance Learning and Online

Bill D. Richards, Lead Instructor  
Geology/Geography Department  
North Idaho College

At this institution, the majority of students enroll in a geoscience course to fulfill a laboratory science requirement for the Associates' degree and mostly in Physical Geology (approx. 140 per semester and 40 during the summer session) and Physical Geography (approx. 120 per semester and 30 during summer session). Many 2yc students are not prepared for the level of "active learning" necessary to be successful in content-heavy lecture courses such as Physical Geology and providing students opportunities to become more active in their own learning process is a major focus of my curriculum development. A major activity within my freshmen courses is the use of the interactive student response devices (specifically the Q6 model from Qwizdom). The goal of implementing response devices is to keep students more active in the traditional lecture setting and provide feedback to the class. Planned self-assessment questions can be placed within an organized lecture presentation or presented in an impromptu fashion in response to specific topic diversions that occur. The devices are also used to randomly select students to answer questions with the goal of enforcing the idea of "being prepared" with the topic(s) for the day (I have to give extra credit for this to have any effect, though). Also, the Qwizdom system allows students at distance-learning sites to connect and participate through smartphone- or tablet-based internet connections. The specific model of response device that I use permits short text answer response (through a keypad just like texting on a phone, so most students feel comfortable). This feature is used to stress to students the need for proper spelling of terms and I incorporate this into advising students how to best study what many see as an overwhelming terminology (practice spelling the term as part of your "flash-card" drill). However, a major challenge has been the reluctance of students to practice the spelling as part of their learning ("Why can't I use a spell-checker"?). The best solution for this challenge has been to remind students that the devices are also how they will enter graded test responses and the system requires proper spelling to receive credit! Through the course of the semester, I can observe that more students arrive prepared and remain more active in the daily lecture, and assessment activities that require short answer written responses contain correctly spelled terms!

Another course activity that I have implemented is providing students "time-on-task" opportunities through Pearson's MasteringGeology and MasteringGeography platforms. My ultimate motivation is to use these platforms to initiate a "flipped classroom" setting requiring students to complete specific activities that I have setup on the platforms, both with the Pearson content and my own, prior to coming to a specific class lecture. A major challenge is how to enforce the requirement. In any case, a pre-lecture assessment will be given (using the Qwizdom response devices) over the assigned Mastering activities to help gauge the participation and monitor success. In the four semesters that I have used these "homework" platforms, I can anecdotally provide that students using the activities in the suggested manner, do fall in the higher percentiles on major exams (is this the result of the activities or a pre-existing qualification of the student?). Perhaps participants in this workshop can provide suggestions for the use of the activities to provide a more complete "flipping" experience.