

Using Learning Assistants and the Concept Warehouse During Virtual Instruction

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Full paper

Creating an interactive learning environment during emergency virtual instruction was a challenge for many instructors. Using physical demonstrations, hands-on investigations, and gauging student understanding were all more difficult over Zoom. We also wanted to find ways to promote active learning, as well as build a sense of community in our classrooms. To do this, several of us utilized Learning Assistants and administered concept questions and instructional tools using the Concept Warehouse.

Learning Assistants are specially trained undergraduate students who serve a different role than a teaching assistant or grader. They take a pedagogy course and participate in a weekly planning/training session with the instructor. Their job is not to answer questions and explain course materials, but to ask probing questions and help students develop their own reasoning patterns.

At both a two-year and a four-year institution, we asked concept questions using the Concept Warehouse (CW), a free online repository of concept questions, instructional tools (eg, virtual labs), and concept inventories. The CW has thousands of concept questions, or ConcepTests, in topics such as thermodynamics, mass transfer, statics, and dynamics. Instructors can sign up for a free account, and can also upload their own questions.

Instructors utilized the LAs in a variety of ways. In one scenario, students typically were placed into breakout rooms of 3-4 students and assigned 2-3 ConcepTests. The LAs would move from room to room to see how the students were doing and guide them to correct scientific reasoning. Towards the end of class, the students went back into their same breakout rooms to solve a traditional homework-style problem. Again, the LAs would visit the different breakout room to provide guidance on problem solving approaches.

A second implementation of the LA model was to hold required sessions outside of the regular class time. During some of these, the LAs would help the students through a series of ConcepTests. Some weeks, however, there were online versions of hands-on Inquiry-Based Learning Activities. The LAs would again visit different breakout rooms, but also bring the group back together to lead discussions on the physical scenarios that were being explored. For example, in the Spool Activity, students were asked to predict the direction of the acceleration and of the friction force when pulling the string on a spool in different directions. The LAs visited the breakout rooms, then brought everyone back together for discussion. Then three other scenarios (pulling the spool thread in different directions) were investigated. Participants were given credit for just participating in the activities.