Ways of Teaching Logic:
Traditional, Online, and Blended Classes

What the presentation will cover

Logic can be taught in a traditional classroom face-to-face setting, as an online class, or as a "blended" course that combines face-to-face instruction and online components. We will report on our experiences teaching logic in all three formats, and demonstrate and discuss some of the tools we used to create online and blended courses: Camtasia, Elluminate, YouTube-style videos, online proof checkers, etc. Ways of structuring all three types of classes, the distinctive challenges that each type of class presents, and strategies for involving students in non-traditional settings will also be discussed. Information needed to build your own online or blended logic course will be provided. We also report on our ongoing research on new tools for logic assessment from cognitive science and computer science and their possible predictive value for success in science. One of the presenters does research in cognitive science, and will discuss diagnostic classification modeling (DCM), and how it can be applied to logic assessment. DCM purports to give instructors more detailed and precise information about the exact skills each student has mastered. We will report the results of applying DCM to logic assessment.

The challenge of teaching in new settings

Learning logic requires regular practice. Online logic classes therefore present special challenges for students, since there are no classroom sessions to attend. We have constructed surveys to gather data on how much time students spent studying, how much they used the various online tools, and run these surveys in traditional, online, and blended learning classes. We'll report on these findings. Without regular classroom sessions, it may be easier for some students to underestimate the amount of work required to learn logic, and hence, given the cumulative nature of logic, to fall behind.

We report on two strategies for dealing with this challenge in online classes. Students must read and sign Student Learning Agreements on the first day of our online and blended logic classes, and students must score 90% or higher, early in the class, on basic connective mastery tests, to stay enrolled.

Engaging students outside the classroom

We report on our use of Elluminate to hold virtual office hours with a whiteboard, live video and voice feeds, and our use of Camtasia to construct video tutorials to address common student confusions as they occur. Demonstrations of Elluminate and Camtasia will be performed. We will conduct an interactive Elluminate session that will permit participants to experience the technology from both the instructor and student perspective.

How work in other disciplines can improve the teaching of philosophy

We will present the studies that we have run using a simple diagrammatic propositional logic test (the PLT) as a diagnostic tool and compare the efficacy of traditional, online, and blended logic classes on that test. The PLT was designed for computer science classes, and studied by people in science education. We have improved the test, modified it to make it suitable for online use using a software tool called Qualtrics, and analyzed its validity and reliability. Some claim (Piburn (1989, 1990) and Almstrum (1999)) that success on this test predicts success in science and computer science. Demographic data we have collected from students in our classes makes it possible for us to comment on these claims, which we will do. We will also give a demonstration of how Qualtrics can be used for assessment.

What participants will do

We encourage participants to bring a laptop, tablet, or smart phone, so they can experience these tools for themselves.

What session hopes to achieve

To give participants the benefits of our experiences teaching logic in traditional, blended, and online formats: the advantages, disadvantages, what technology is available, how it can be used, a blueprint for how they can develop own logic course.

Handouts: Handouts will be give an overview of each technology we used in the online and blended classes, how we used it, and resources to get started.

List of Equipment Needed: We will need a projector and a wired or wireless Internet connection.

References

Almstrum, Vicki. (1999) The Propositional logic test as a diagnostic tool for misconceptions about logical operations. *The Journal of Computers in Mathematics and Science Teaching* 18 (3): 205 – 224.

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Osguthrpe, Russell and Graham , Charles. (2003) Blended Learning Environments: Definitions and Directions. *Quarterly Review of Distance Education* 4(3): 227 – 233.