The individualized treatment effect (ITE) concept from personalized medicine applications is introduced as a means to quantify individual student performance under different instructional modalities or intervention strategies, though a given student experiences only one such "treatment". The ITE is presented within an ensemble machine learning approach to evaluate student performance, identify factors indicative of student success, and study persistence. The methods developed are motivated and illustrated by a comparison of online and traditional face-to-face offerings of and supplemental instruction in a large enrollment introductory statistics bottleneck course. The ITE allows us to characterize students that benefit from either the online or the traditional offerings and the supplemental instruction component.