

# Sources of Grade Variability in Multi-Section Lab Courses: Should We Seek Legitimate Correction Factors to Mitigate Detectable Variations in Student Grades?

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Grades amongst groups in large multiple section lab courses can be highly variable. The spread amongst lab sections in our own courses were at times +/- 4.5%. This spread is of concern since we strive for fairness in how students are evaluated. More importantly students themselves expect this to be true. We examined grades from two large multiple section lab courses (819 students and 358 students) to identify the sources of variation in student's final lab grades. TA, lab section, room assignment, day of lab, time of lab and home program of individual students were used in a linear mixed effects model to determine which variables were important in determining a student's final lab grade. Some of the sources of variation we detected such as room assignment can be controlled for administratively while best practices in TA training can reduce TA bias and thus a portion of the overall differences in scores amongst sections. Surprisingly, we discovered other significant sources of variation that were self-selected by the students and so out of reach of any mitigation process that we would be able to perform. In this mini workshop we will present the results from our analyses and then open the floor to discuss potential strategies to reduce grade variation. For each source of variation we will also discuss whether or not mathematical corrections should be applied to mitigate its effect on overall grades if it were possible. We ask when if ever would these corrections be appropriate.

**Keywords:** GTA Training, Grade Variation, Large Multi-Section Labs, Marking Consistency

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## About the Authors

Saewan Koh is the lab coordinator for a large, second-year, multi-section, introductory ecology course (*Principles of Ecology*) in the department of Biological Sciences at the University of Alberta. Saewan received his Ph.D. in biology in 2002. His dissertation was a multiple scale evaluation of the

effects of a large-scale disturbance on the trajectories of forest plant communities and ecosystems. Saewan is interested in teaching pedagogy, curriculum research and curriculum development. For fun Saewan likes to conduct research into the relationship between climate change and shifts in plant community distributions in sub-arctic alpine tundra. When not crunching numbers Saewan enjoys, hiking, camping, photography, motorcycling and full contact hide and seek. Saewan is married with two kids, two cats and 14 Nerf guns.

Mark Wolansky earned a B.Sc. in Molecular Genetics and Heredity from the University of Alberta and a M.Sc. in Plant Biology also from the University of Alberta. He is currently the Laboratory Coordinator for Biology 207, a large, multi-section, introductory genetics course in the Department of Biological Sciences at the University of Alberta. Prior to this position, Mark taught lectures and labs for universities located in and around Edmonton, Alberta Canada. The fields he has taught include genetics, cell biology, microbiology, and botany. Mark currently sits on the ABLE Board of Directors as first year Member-At-Large as well as serving on both the Major Workshops and Proceedings Committees. He is also a member of the Alberta Introductory Biology Association.

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