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Curriculum Development as Professional Development: A Model for Adjunct and Graduate Student Instructors Teaching Multi-Section Lab Courses

Janet Vigna[1], Jen Cymbola, and Jodi DenUyl

[1] Grand Valley State University, Dept Biology, 325 Henry HallAllendale MI 49401 USA (**vignaj@gvsu.edu**)

Instructors for our multiple section non-majors biology lab course are primarily adjunct instructors and graduate students. While some of them have been teaching lab sections for years, most of them are fairly new to teaching and have never had training in effective teaching pedagogy or curriculum development. In an effort to improve teaching performance and instructor retention, and to provide professional development for our instructors, we involved them in a revision of the lab course curriculum.

Participants in curriculum development workshops first engaged in a literature review of biology content and effective pedagogical strategies. Based on the evidence found in the literature related to effective teaching and learning, instructors created a list of pedagogical learning objectives for the course, reviewed the old lab curriculum, and designed new laboratory experiences, when necessary, to meet the new objectives. The inclusion of adjunct and graduate student instructors in curriculum development provided the opportunity for professional development as well, something that was not available to these instructors prior to this experience. After engaging in the process of curriculum development all instructors agreed that this type of collaboration between lab instructors promotes an increase in teaching effectiveness. One hundred percent of instructors felt it was important to meet regularly to discuss teaching experiences, receive training, and develop curriculum. Eighty-three percent of instructors felt this professional development experience will help them reach their future professional goals. It is our desire that engaging instructors in curriculum development will enhance their teaching effectiveness and support their professional success in academia in the future.

During this mini-workshop, we presented an evolution lab activity revised by curriculum development participants. The activity explores the production of phylogenetic trees based on a comparison of traits unique to the skulls of a variety of primate species. Students make comparisons between skulls, generate a list of traits they may use to distinguish between species, and use pipe cleaners to create an evidence-based model of relatedness between the primate species. Student groups then compare pipe cleaner phylogenetic trees and use evidence to defend their models. Additional evidence may then be provided, including DNA sequences, geographic data, fossil age, etc., that forces students to re-evaluate their trees and resolve discrepancies in the data with a new model. This activity addresses several of the pedagogical learning objectives instructors set for the course, including a) achieving scientific literacy, b) making science approachable and interesting, c) improving critical thinking skills, and d) engaging in the process of science through open inquiry.

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