

The Impact of Teaching Plants Through a Disease Module on  
Student Engagement, Student Attitude, and Learning Gains

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**Abstract:** This action research study will investigate the incorporation of a disease module into Biology instruction using a thematic problem-based approach and the impact on student engagement, attitude, and learning gains. Students will complete baseline and final surveys to evaluate engagement and attitudes toward Biology and the specific unit topic, Plants. The research will use baseline and final assessment scores to measure learning gains, aligned with state standards.

**Rationale:** Through my experience in the classroom, I have observed some major shifts in education as a whole. However, the transformation that has taken place in how Biology is taught has been exceedingly considerable. I have been teaching Biology for 17 years and have observed students' genuine interest and engagement in Biology gradually, but consistently decline over the years. Coupled with the Florida Department of Education's institution of the Biology End-of-Course Exam (EOC) and the pressures that come with the breath of the content assessed on the Biology EOC, the Biology classroom has become foreign landscape for many Biology teachers in our state. As a result, students have become very disenchanted in the Biology classroom because there are fewer opportunities for hands on activities and project based opportunities due to time limitations. Further, students often approach Biology with apathy due to their past experiences with science. All of which is very disheartening for me, as a Biologist teaching science.

As all teachers, I want my students to succeed, obviously according to the Florida State Standards. However, I greatly desire that a passion for Biology be ignited in my students. The passion to observe the world around them, question those observations, investigate their questions, develop conclusions based on the outcomes of the investigations and ask more questions.

I will endeavor to investigate the effect of using a disease module to improve student engagement and attitude toward Biology, specifically Plants. My thinking is that if I can engage students with Emerging Pathogens and Disease, then students will develop more positive attitudes toward Biology and result in greater learning gains.

**Intervention:** The foundational intervention used in this action research proposal is the overarching theme of Emerging Pathogens and Disease. I will incorporate a Disease Module into the instruction of the specific Florida State Standards on Plants and Nature of Science (SC.912.L.14.2 and SC.912.N.1.1). This study will include Biology Honors students during the first two (2) weeks of October, 2017. Standardly, I have approached this unit on Plants with direct instruction. However, the instruction will be both thematic and project-based.

**Data collection and analysis:** This study will employ both qualitative and quantitative data. Interest Inventory and Science Attitude Survey will be utilized to determine baseline and final quantitative

data. Additionally, the qualitative data will be collected by assessing before and after the instruction of the unit instruction with interventions.

**Connections to CATALySES summer institute:**

- Plants Get Sick, Too!
- Microscopy Skills
- Resources available through IFAS Plant Diagnostic Center
- Plant DNA Extraction
- Plant Microbes Scavenger Hunt (???)