Implementation Plan and Teaching Notes

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**Context for Use** (details about your course)

Instructor: Elâine Ribeiro

Department: Biology - Universidade de Pernambuco  
Audience Level: **Undergraduate**

Undergraduates: **Majors**

Instructional Setting: **Lecture/Field/Group Activity**

Number of Students: 16

Expected dates of implementation: 23nd Mar 2023

**Original OCELOTS Module Title:** Healing the scars: Tropical rainforest carbon cycling  
**Link to Module on Gala:**https://www.learngala.com/cases/tropical-rainforest-carbon-cycling/5

**Learning Goals of Module:**

* Explain how the processes of photosynthesis and respiration determine carbon stocks in plant biomass (Plant-level carbon cycling)
* Describe the processes that influence global carbon cycling
* Compare how different tree species differ in their carbon cycling (Plant-level carbon cycling)
* Compare different land-uses in terms of their effects on the global carbon cycle
* Calculate your carbon footprint

**Pedagogical techniques used**:

* Lecture, discussion and work group in taking field measurements and a synthesis activity.

**Adaptations made or parts used if the entire module was not used**

* As the versions of the module were in English and Spanish, I prepared a lecture in Portuguese with an overview of all module chapters to facilitate students’ comprehension. I did not use the exercises of the module because I was not teaching an Ecology course this semester, but I invited students to experiment about how to measure plant biomass, and later convert in C and CO2 values to compare with their carbon footprint.
* Field measurements: As a field study, we visited our university garden where we measured the diameter at breast height and plant height of some species (Fig. 1) to simulate the estimation of plant biomass and carbon by species. Students also tried to identify the species genera and families based on our previous classes.
* Group project in the classroom: Students worked in groups to produce cards about Caatinga species for which they had estimated C stocks. The cards also included taxonomic and ecological information. This activity culminated in time to coincide with celebrating Caatinga day on April 28. (see the cards in LaBGE Instagram page @labge\_upe).

**Supplemental materials created**

* Lecture notes in Portuguese

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**Assessments**

* As most students actively participated in the activities proposed during the module implementation, I considered it as a positive assessment. Module implementation was demonstrated to be a good strategy for learning in our Systematic Botany course, because it enabled us to put into practice the knowledge learned during the course through discussions, experimentation and creation of material by the students.

**Changes Made (If any)**

* Not applicable

**Teaching Notes**

1. Overall, how did your implementation go?
   1. What went well and why?
   2. What went wrong and why?

I think that my module implementation was a very interesting experience in the Botany Systematic course because it gave students an opportunity to connect distinct contents they accessed during the other parts of the undergraduate Biology program. I implemented the module in two classes of 3 hours, but for the next opportunity I plan to implement it in 3 classes to expand the time of experimentation.

1. What was the prep like?
   1. How much time went into prep?
   2. Did you have to do any prep ahead of implementation?

I took some time to read all the module; after that, I wrote the key points of the module to build a presentation in Portuguese with an overview of the module. I also studied to plan how students could do the carbon estimation experimentation.

1. What feedback (positive or negative), if any, did you get from your students about this experience?

During the implementation students were very participative, discussing topics and attentive. I felt that the experimentation proposed left them very excited, and they felt very proud of themselves with the cards produced.

1. What do you wish you’d known before you ran the activity?

I did an adaptation of the module to the Systematic Botany course, so I really planned how I could insert the module content and make it relevant for the course objectives. I think that each instructor can adapt the module implementation to their own situation, according to the features of the student group.

1. Do you plan on continuing to use this module in your future courses?

Yes.

1. What would you do differently if you were to implement this module again?

I would plan more hours with experimentation of plant biomass, C and CO2 estimation to cover a larger number of species.

1. How does this activity fit in your overall course curriculum?

One of the aims of the Systematic Botany course is to understand the ecological importance of vegetation diversity. With the module implementation I could achieve this aim in practice by demonstrating the essential role of different plant species of Caatinga forest in Brazil in assimilating CO2 and accrual of carbon stocks.

1. In what ways, if any, did you modify your teaching practice with this activity?

In general, my classes of Systematic Botany I mix lectures, practices of identification and preparation of materials to herbarium. I think that my experience with module experimentation enriched the course by demonstrating the importance of the contents in ecological studies, where students could in a future figure as professionals.