Cultivating Careful Observation and **Community in Plant Sciences**



and Natural Resources Plant Sciences

Randa Jabbour

Guiding Value

Careful observation and reflection builds knowledge and feeling of the world.

Student Learning Outcome

Given examples and opportunity for repeated practice, students will develop a field notebook that spans multiple sites and integrates visuals/audio with text.



Guiding Value

Community empowers students and is an important part of how science works.

Student Learning Outcome

Given an active learning laboratory, students will integrate their skills and perspectives to complete a plant growth

Bloom's Cognitive: Application and Synthesis **Bloom's Affective:** Valuing and Organization

Pedagogies

Students had the choice between keeping digital or analog notebooks, providing options for expression according the Universal Design of Learning guidelines⁴.

research project and presentation.

Bloom's Cognitive: Synthesis *Bloom's Affective:* Valuing (Involvement & Commitment)

Pedagogies

- Flipped classroom & brainstorming: Read & watch info about field notebooks before class. During class, identify elements essential to include in field notebook based on real examples.
- *Single-point rubric:* Students build checklist to evaluate if a condition has been sufficiently met and work together to define clear expectations for this work¹. Aligns with Columbia's Principles of Inclusive Pedagogy² to "Set explicit student expectations: Articulate assessment criteria."

Assessment

Student Mid-Term Self-Assessment of Field Notebook

Inquiry-based learning: Students choose research question, access and summarize literature, conduct experiment and collect data, summarize findings and present to the class.

Assessment

Formative:

Peer and instructor evaluation of practice presentation

Summative:

Self and group member evaluation on contributions to group

Student Lessons

Compiled with help from TA Aspen Waldron

- Working as a team in a professional scientific atmosphere
- Revision is a very important part
- Very helpful to work as a team and utilize individual skills
- Importance of time management

Formative:

Students self-assessed their notebook according to the rubric they developed as a class.

Summative:

- 7/8 students self-assessed that they met the requirements of the assignment.
- Students reflected positively on the assignment, calling it fun, creative, useful, and fantastic.
- The student who self-assessed they did not meet the requirements indicated both needing more guidance and having a chaotic semester by which this work was brushed aside.

Next Steps

- Incorporate peer and expert evaluation into notebooks
- Support with sketching workshop³



Student Reflections

"The field notebook was actually very helpful in making you slow down and look around more and not just miss some really cool and important things that go on in simple areas such as my yard."

"I have always been a textbook oriented learner, so it was a nice deviation from my comfort zone to approach the course content through this field notebook."

"I really enjoyed the autonomy to make my observations on my own schedule and give each entry adequate

Instructor evaluation of final presentation



- I made a really good group of friends
- How to divide time
- How to help the community and educate others
- Everyone's presentations were cool.
- It was a lot to take in.
- Nothing? I'm not sure how this relates to the lab project we did.

"I learned that especially in college environments people want to see you grow and learn through experiments even if they aren't perfect."

Next Steps

- Include collaborative skills into course pre- and post-assessment
- Practice active listening in class⁵

Acknowledgements

consideration."

"The ability to sit down on my own time allowed me to think a little harder and look a little closer."

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4. Universal Design of Learning (UDL) Guidelines. Located at https://udlguidelines.cast.org, accessed April 29, 2024. 5. Bunnell, S.L., Jaswal, S.S., and Lyster, M.B. (2023). Being Human in STEM: Partnering with Students to Shape Inclusive Practices and Communities. Routledge Press.