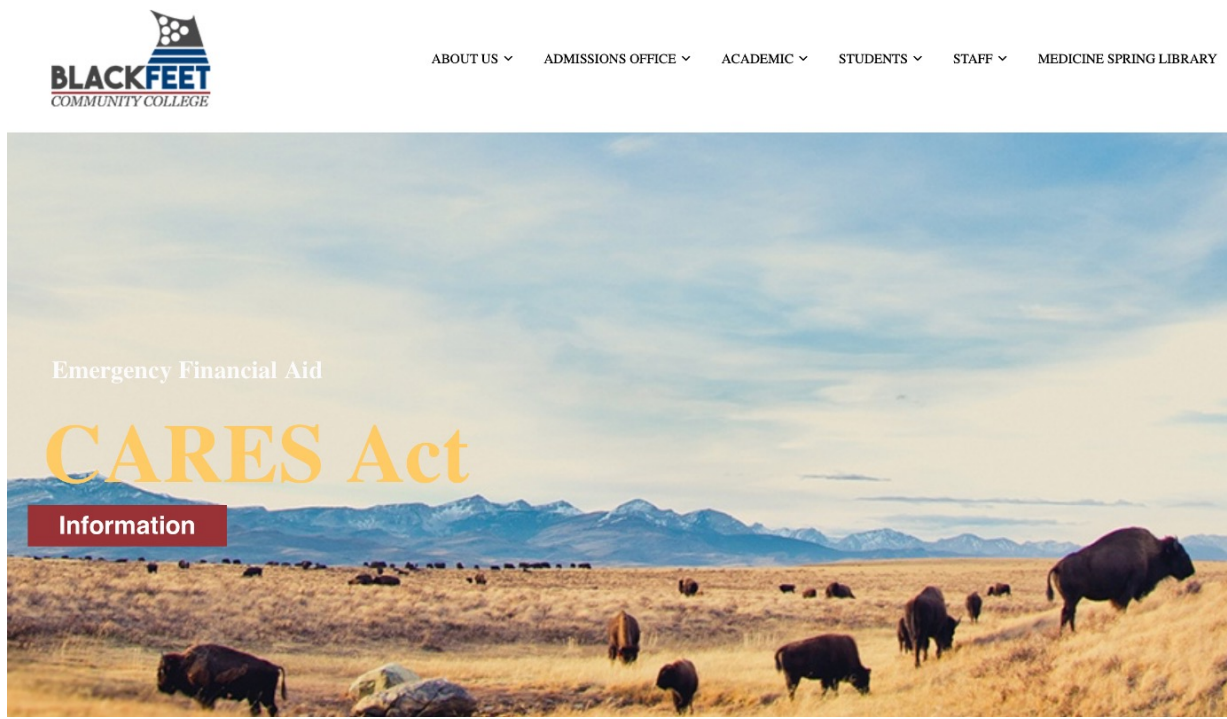


# Designing, Teaching, and Assessing an Innovative Online Science Curriculum for Effective Student Learning

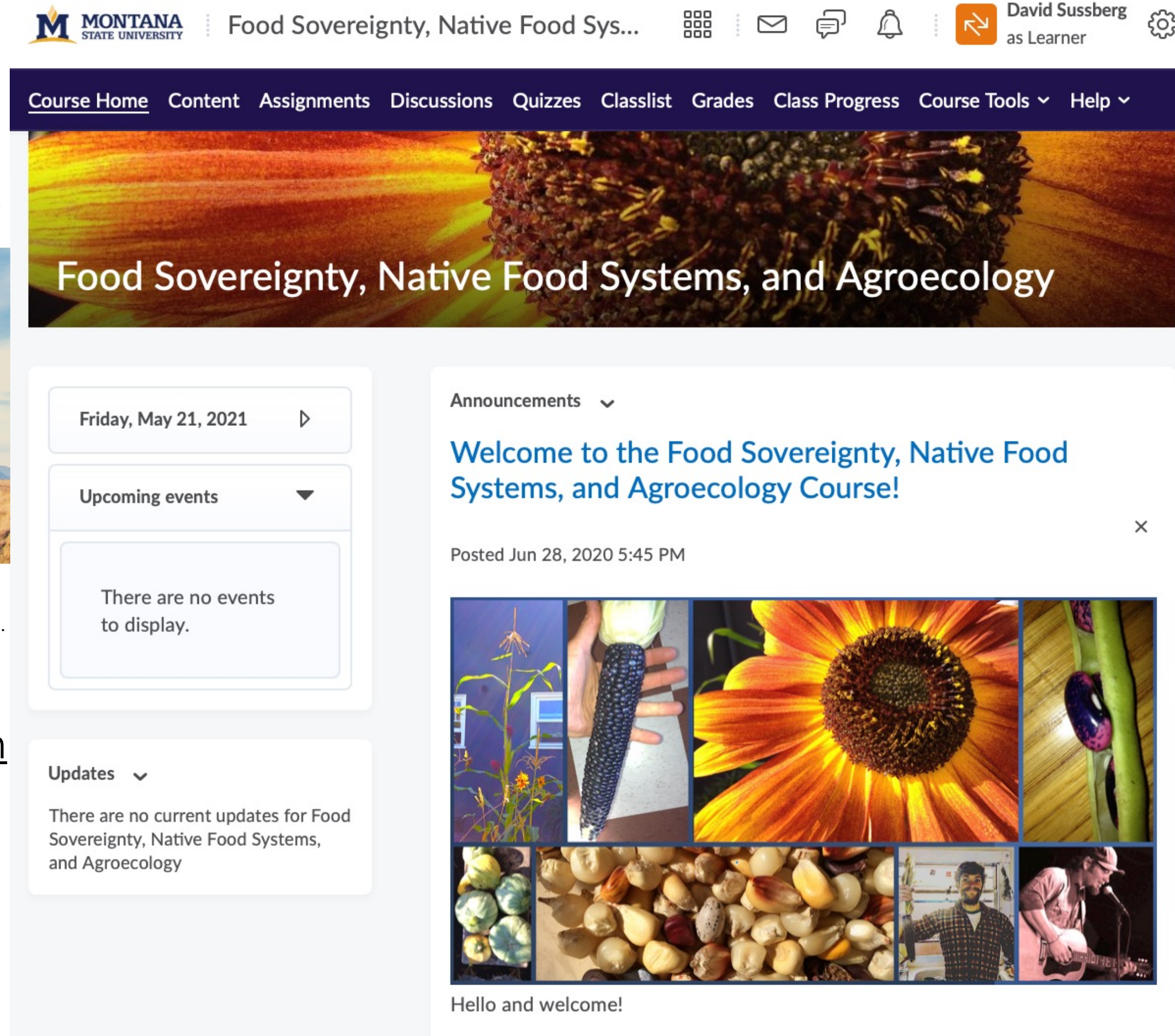
David Sussberg, Browning, Montana Spring, 2021

## Study Population

A Blackfeet Community College student and staff member.



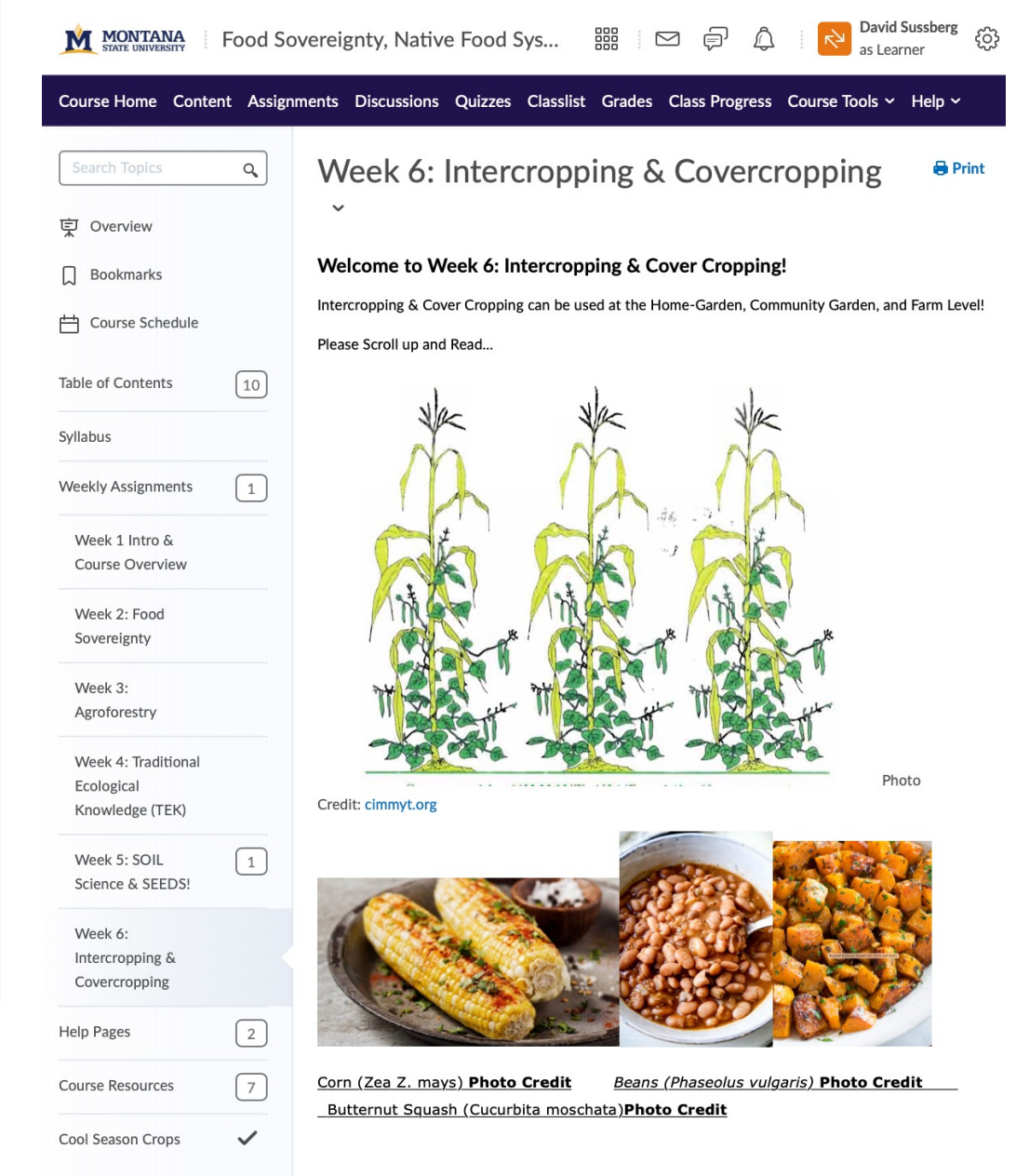
Screenshot of Blackfeet Community College's website (<https://bfcc.edu>).



Screenshot of my Brightspace (D2L) course.

## Study's Scope

For my MSSE Capstone project I design, taught, and assessed a six-weeklong online science course, focused on the science of Agroecology, Native Food Systems, Food Sovereignty, and Traditional Ecological Knowledge (TEK).



- Please complete the following before Wednesday Midnight (Mountain Time):
- WATCH:**
- La Milpa (The 3 Sisters Farming System)
  - Introduction to Cover Cropping
  - Cover Cropping Talk
  - Optional Videos:
    - How This Navajo Chef Brings His Native Food Traditions Back
    - Biocultural Crops and Traditional Farming - Dreaming New Mexico | Bioneers
    - One Awesome way to Grow Winter Squash... Vertically!
    - The Science Behind the Three Sisters
    - Oneida Corn Harvest
    - Food Security & Three Sisters Sustainability - Conversations in Cultural Fluency #3
    - How to Sow Carrot Seeds
    - Cover Cropping Talk and Q&A

- READ:**
- the difference between intercropping and companion planting
  - Please note, the following Reading is **Incredibly Important** and you have this week and next week to read it, so start super soon:
    - ON INTIMACY WITH SOILS Indigenous Agroecology and Biodynamics BY DEVON G. PENA**
  - Traditional Mayan Farming
  - Covercropping & Intercropping
  - Benefits of Cover Cropping
  - Optional Reading:
    - Seeds and beyond: Native Americans embrace 'food sovereignty'
    - Four Ways Mexico's Indigenous Farmers Are Practicing the Agriculture of the Future
    - SQUASH Varieties + Health
    - The Principles of Agroecology
    - Chapter 1 Introduction: Agroecology as a Transdisciplinary, Participatory, and Action-oriented Approach
    - Towards an Alternative Development Paradigm Indigenous People's Self-Determined Development
    - Precursors of Decolonial Pedagogical Thinking in Latin America

- EXPLORE:**
- Audio Podcast of Blackfeet Agriculture Resource Management Plan, Part 2
  - Cool Season Crops
  - Environmental Factors Affecting Seed Germination

- COMPLETE:**
- In the Discussion Area Please post one Intercrop System that you believe would be important/appropriate to grow at BCC.

Screenshot of my Brightspace (D2L) course.

## Mix Methods Research Approach

- Post course Questionnaires
- Post course Student Interviews

## Central Focus Research Question

- What are the outcomes of designing and teaching an innovative online science curriculum?

### Sub-questions

- To what degree do students understand the science concepts taught?
- What are the attitudes of participating students towards this online science course?
- In what ways has this impacted me as a teacher?

## Highlighted Quotes from the Student Interviews

Teri (a BCC Staff Member) stated "It's just like oh wow I've learned a lot! Amazing class! I learned a lot and enjoyed the structure of the course and everything... You have to be an effective teacher in order for us to learn all that stuff!" "Agroforestry is the best thing ever!"

JC asserted that "I would say that the course's design has helped my overall understanding of the science of agroforestry, because I had little to no knowledge on actual planting. I only planted maybe like a handful of things over my lifetime. Yeah, this was a great push forward in the direction of learning different types of forestry and agriculture."

## Implications to My Teaching

- Immensely empowered me as an educator and enhanced my knowledge and skills in designing and teaching future online courses.
- Learning to design and facilitate an online Brightspace (D2L) course effectively boosted my confidence and fostered proficiency in future LMS curriculum construction and instruction.
- The overwhelmingly positive feedback expressed during the student interviews clearly illustrated that I can effectively instruct college students — via online education — in the science of Agroecology and sustainable food systems.
- This study's data indicated that the combination of a seamlessly well-organized course design and an instructor attentive to student's learning needs produces effective student learning, I will design and teach future online science courses improving upon these revelations.

## Questionnaires Results

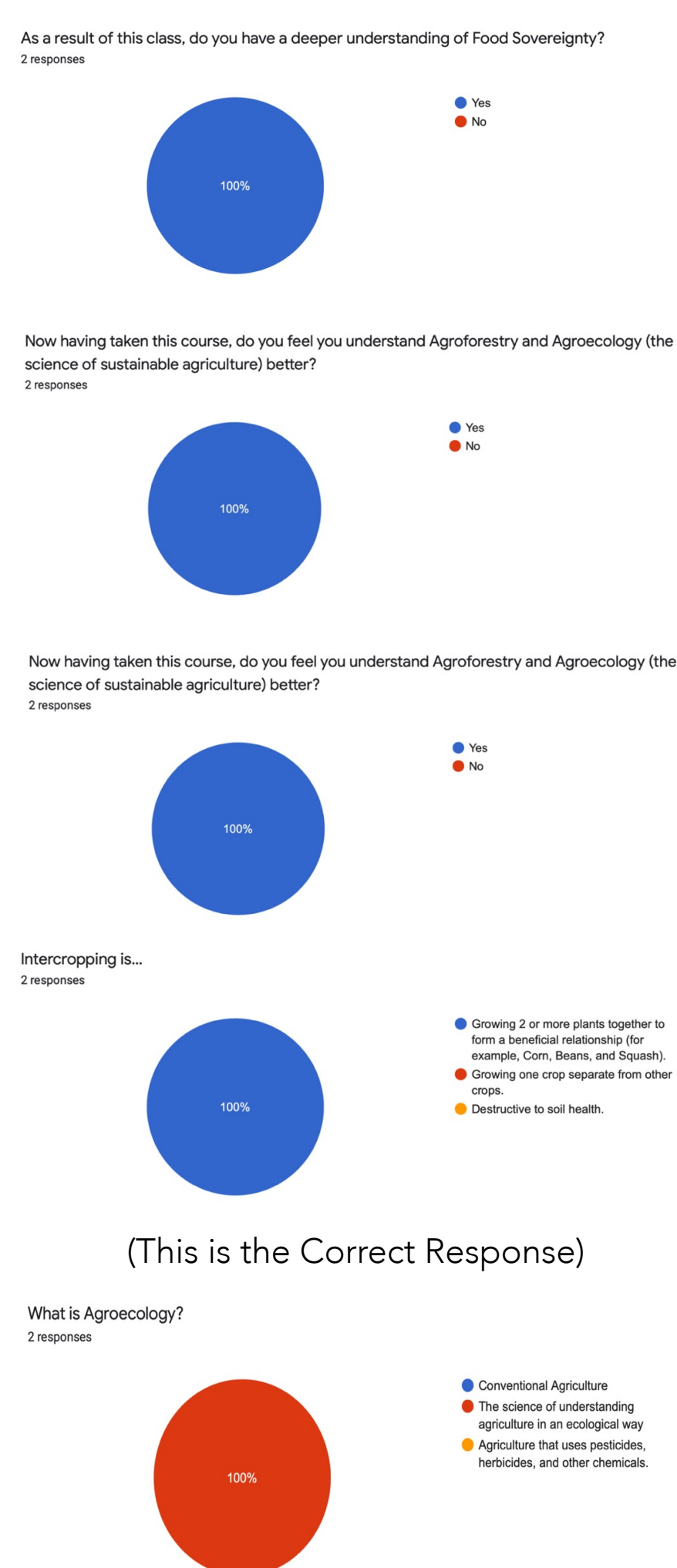
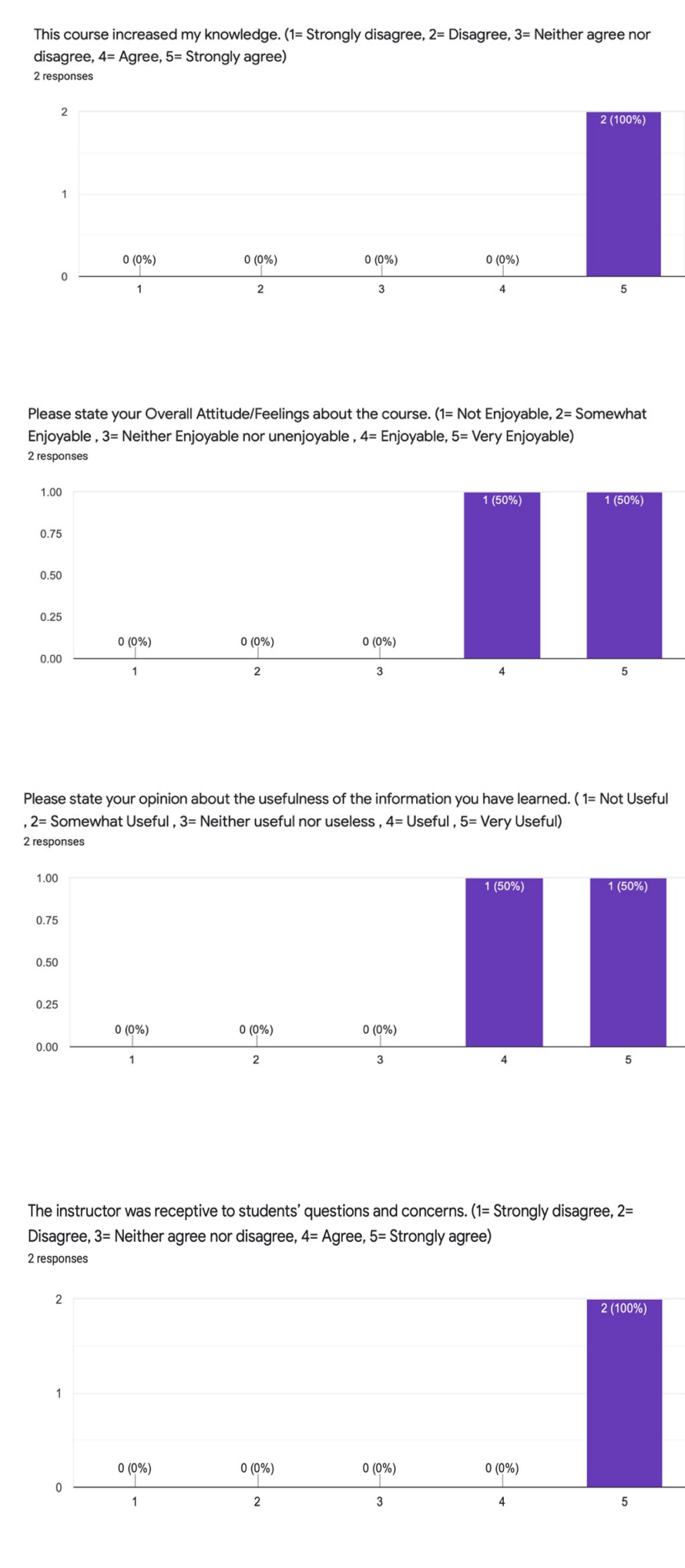


Figure 2. Questionnaire results of students' self-assessment of how well they understood essential course concepts.

Figure 1. Graphical representation of Questionnaires results of student attitudes towards the science course.