

ABSTRACT

- University of Nebraska-Lincoln (UNL) offered Soil Resources course in a blended learning structure in addition to the online and traditional sections
- Blended learning section consisted of a mix of online learning materials and a weekly 2-hr lab session
- Evaluation of course structure effectiveness was done through exam results and survey responses
- 45% of students were satisfied with blended learning structure
- No significance in exam scores and survey responses among the three teaching methods



OBJECTIVES

- Develop an effective blended soil science course
- Evaluate students' reaction to the blended approach
- Compare blended approach to distance and face-to-face traditional approaches

Acknowledgments:

This research was completed with the help of fellow teaching assistant Kolby Grint who provided great assistance and insight with this poster.

References:

Porter, W.W., C.R. Graham, K.A. Spring, and K.R. Welch. 2014. Blended Learning in Higher Education: Institutional Adoption and Implementation. *Computers & Education* 75: 185–195.

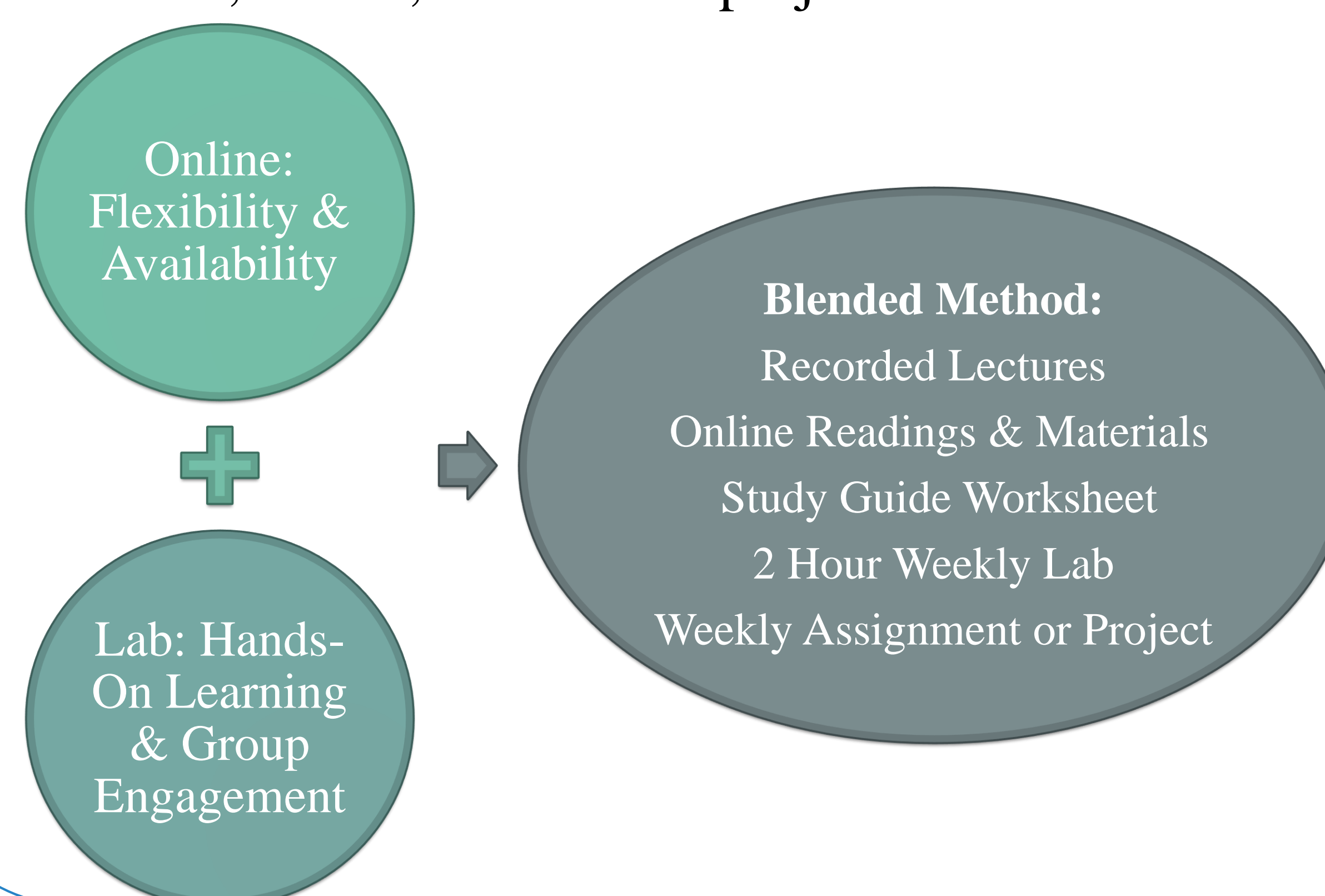
Garrison, R.D., and H. Kanuka. 2004. Blended Learning: Uncovering its Transformative Potential in Higher Education. *The Internet and Higher Education* 7(2): 95–105.



METHODS

Course Format:

- Prior to lab: students watch pre-recorded lecture videos, read materials, complete study guide worksheet, and complete an online assessment through LMS.
- Weekly lab: instructors answer student questions, students engage in peer-to-peer instructions on complex concepts through iclicker questions, and complete hands-on activities.
- Following lab: students are assessed through concept sketches, exams, or soil core project activities



Evaluation of Blended Learning Structure:

- Exam Grades
 - Student, TA, and Instructor Feedback
 - Survey Responses
- Question Types:**
- Helpfulness of course components in achieving learning outcomes
 - Engagement
- Student responses were analyzed using ordinal response models in R version 3.3.1
 - Analysis of variance was carried out on those ordinal response models

RESULTS

- Course Enrollment:
 - Blended: 20 students; Online: 35 students; Traditional: 101 students
- Blended Class Average Grade was an 83% (B)
- 45% of students who took the blended structured course preferred this method because:
 - Flexibility and Independence
 - Commuting and scheduling convenience

| How helpful has this course been to your ability to complete/meet the following objectives for the Soil Resources 153? | Pr> χ^2 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Explain the multiple functions of soil in the global ecosystem and how land use and/or management may impact soil functions and soil erosion. | 0.9889 |
| Describe soil physical properties of texture, structure, density, porosity and relate these to soil water holding capacity, plant available water, and infiltration. | 0.7978 |
| Describe soil chemical properties of clay and OM colloids, ion exchange, and acidity, and relate these to soil and general soil fertility for plant growth. | 0.4347 |
| Explain how abiotic and management factors influence ecological cycles of carbon and nitrogen. | 0.503 |

Table 1: Soil Resources 153 student responses to course ability in meeting learning objectives in spring 2017 at UNL

DISCUSSION

Great:

- Students came prepared to weekly lab and worked through complex concepts by solving iclicker questions
- Exam and survey results found no significant difference between the different teaching methods (Table 1)

Difficult:

- Matching students to the best teaching approach for them based upon needs and expectations

Different:

- Create a lab manual to provide hard copies of additional resources, and to organize study guides and lab worksheets
- Add an optional recitation time for students to ask questions prior to taking quizzes
- Additional study of demographics and learning styles