

ELP 510: Connect-to-Science through Learning Gardens

Leadership for Sustainability Education (LSE)

Educational Leadership & Policy

Graduate School of Education

Portland State University

Summer 2012

CRNs: 82783, 82784, 82956

Monday-Thursday, June 18-28, 1:00-5:00

Location: Learning Gardens Laboratory

Professors' Contact Information:

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Course Description:

Educators from various contexts and in various stages of professional development (in-service and pre-service teachers, extended-day teachers, informal science educators, etc.) work together to learn theory and best-practices of science and sustainability education, then put this understanding into practice by designing curriculum that utilizes learning gardens (at schools and/or community sites) as a rich context for STEM learning and teaching. Participants will specifically focus on developing standards and inquiry-based curriculum that integrates content, formative assessments, and experiential learning activities.

The purpose of this course is for teachers and graduate students to:

- Build professional learning communities among the entire group, spanning various schools and locations, that support the development of knowledge, skills, and dispositions necessary for reflective practice and action research (GSE 1.1, 2.2, 3.1, 3.3);
- Develop an understanding of theoretical frameworks for Science, Technology, Engineering, and Math (STEM) and Garden-based education (GBE) (GSE 2.1, 2.2, 3.1, 3.2, 3.3);
- Apply STEM education research and GBE theory into practice, through collaborative development of STEM-focused, integrated garden-based learning units (GSE 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 3.3).

Graduate School of Education Vision Statement & Goals:

Vision - Preparing professionals to meet our diverse communities' lifelong educational needs			
 Diversity and inclusiveness Candidates work effectively with diverse populations (1.1) Candidates promote inclusive and therapeutic environments (1.2)	 Research-based practices and professional standards Candidates critically analyze and implement research-based practices (2.1) Candidates demonstrate appropriate professional knowledge, skills, and dispositions (2.2)	 Impact on learning and development Candidates ensure that all learners and clients succeed (3.1) Candidates use technology to enhance learning and development (3.2) Candidates influence policy and provide leadership for organizations (3.3)	 Evidence-informed decision making Candidates use evidence to address problems of practice and make informed educational and therapeutic decisions (4.1)

Course Objectives:

Upon successful completion of this course you will:

1. Feel connected as co-learners to colleagues from your school and other locations (GSE 1.1, 2.2, 3.3);
2. Become familiar with the new Framework for STEM Education (Framework) (NRC, 2011) and the Next Generation of Science Standards (NGSS)(Citation)(GSE 2.1, 2.2, 3.1, 3.2, 3.3);
3. Develop an understanding of garden-based educational theory and how it aligns with STEM education (GSE 2.1, 2.2, 3.1, 3.2, 3.3);
4. Identify appropriate strategies for differentiated instruction for diverse learners (GSE 1.1, 1.2, 2.1, 2.2, 3.1, 3.2, 3.3, 4.1);
5. Work collaboratively with other teachers and educators to design integrated STEM units that support students' development of scientific understanding as described by research-based learning progressions outlined in the Framework and NGSS (GSE 1.2, 2.1, 2.2, 3.2, 3.3);
6. Design standards and place-based, integrated units using school gardens as a context for learning and theme for developing an understanding of STEM educational practices (GSE 1.2, 2.1, 2.2, 3.1, 3.2, 3.3)
7. Gain experience developing standards-based curriculum that utilizes gardens as an integrating context for teaching and learning (GSE 2.1, 2.2, 3.1, 3.2, 3.3).
8. Identify appropriate, research-based formative assessment strategies that can inform teaching and help guide instructional practices (GSE 2.1, 2.2, 3.1, 3.2, 3.3, 4.1).

Instructional/Learning Needs:

Students meeting an accommodation pursuant to federal, state or institutional education regulations should notify me. Also please contact the Disability Resource Center 503.725.5664 (503.725.4150, TTY or Relay 503.725.4178) to document your disability. That office will provide appropriate support and services.

D2L:

This course is supported by the online forum, D2L. As a PSU student, you have access to all of the library's resources (see below). Most of the readings assigned for this course can be accessed through the library and direct links have been included in D2L. To access the syllabus and other documents online go to: <http://psuonline.pdx.edu/> Click "D2L Login."

Campus Assistance for Writing:

The PSU Writing Center provides assistance at no cost to undergraduate and graduate students <http://www.writingcenter.pdx.edu/>.

Library Resources:

You can access library databases and other resources at: <http://library.pdx.edu>

An excellent online tutorial on conducting library research is available at <http://library.pdx.edu/tutorials/beginresearch/1> and can be accessed from the course homepage on D2L.

Course Expectations:

- **Environment of Respect:** Disagreement and diversity of opinions are encouraged. You will be challenged to think critically about the impact of cultural differences, which may include gender, race, socioeconomic status, physical and cognitive ability, sexuality and other forms of diversity. You are encouraged to ask difficult questions and share comments. Please be respectful of others as we listen to and try to understand differences.
- **Cooperative Learning:** In this course, learning is a collective process in which we have the opportunity to help each other generate meaning throughout the term. As collaborators in this learning process, participation is welcome and encouraged. The richness of this class will depend on the comments, questions, insights, and active participation that you bring to class.
- **Personal Responsibility:** You are expected to engage fully in this class and take action if you need help. Please communicate any concerns about assignments, deadlines, or classroom activities.
- **Academic Integrity:** Please adhere to university policies. Please take special note of policies regarding plagiarism and course withdrawal. The University's Code of Student Conduct may be found at <http://www.pdx.edu/dos/codeofconduct>.

Required Readings:

Williams, D. R., & Brown, J. D. (2012). *Learning gardens and sustainability education: Bringing life to schools and schools to life*. New York: Routledge.

Other book chapters, articles, and websites as assigned: *see daily schedule—links to articles are included on syllabus and in D2L.*

Assignments:

Attendance and Participation 20% —Course Goals 1, 2, 3, 4, 5, 6, 7,8

This will be an action-packed two-weeks, full of participatory, experiential learning activities! Attendance and participation is required. Please come to class prepared (read, reflect, take notes, prepare questions) and be a vocal participant as well as an active listener. Your shared learning experience will greatly depend on everyone’s active involvement in this course.

Reflective Writing 20%—Course Goals

Reflecting on this two-week experience, write a 3-5 page, single-spaced paper that addresses the following questions:

- How did this collaborative experience impact your thinking about teaching and learning? Related to STEM? Related to Garden-based education?
- How has your understanding of STEM concepts and the use of formative assessment change?
- What are the most important ideas and/or actions you intend to take away from this experience? How might you incorporate these ideas into your practice next year and beyond?

Curriculum Map/Outline and STEM-Focused, Garden-based Unit 60%—Course Goals 1

- Curriculum Map/Outline
- Integrated unit
 - Identifies appropriate STEM standards—content and practices
 - “Unpacks” standards to articulate learning objectives for the unit and individual lessons
 - Identifies or develops 2 (minimum) formative assessments strategies that are incorporated in meaningful places in the curriculum unit
 - Identifies or develops learning activities to meet standards and learning objectives

Scoring guidelines for STEM-focused, Garen-based unit:[SSK1]

	10 points
	15 points
	15 points
	15 points
	10 points
	5 points
	20 points

Grading Scale:

- A 90-100 Excellent (A- 90-92; A 93-100)
- B 80-89 Satisfactory (B- 80-82; B 83-86; B+ 87-89)
- C 70-79 Below graduate standard
- D 60-69 Failure

****Late Paper Policy:** [SSK2]

Papers are due on the date given in the syllabus or amended by the instructor. Since this is an intensive, two-week summer course, you (and your group members when appropriate) may decide to submit assignment by the final date of the regular PSU summer term (August 17). Late papers will be **accepted only with prior approval**. Late papers (including papers that are e-mailed after class) without prior approval will incur a 10% penalty. Students anticipating problems with due dates should contact the instructors in advance to arrange an extension and avoid a penalty. In order to receive credit for this course, all work **MUST** be submitted by August 17, otherwise, you will be required to reimburse your district for the cost of the course and not receive the graduate credits.

Class Schedule (Guest speakers to be announced):

Date-Topic/Theme	Class Activities	Readings & Assignments
Day 1—June 18 Introductions; course overview; Syllabus	<ul style="list-style-type: none"> • Introduction to Learning Gardens & Sustainability Education (Dilafruz); • Intro to Inquiry (Nancy) 	
Day 2—June 19 Learning Gardens and Sustainability Education	<ul style="list-style-type: none"> • Principles of Learning Gardens & Sustainability Education (Sense of Place; Curiosity & Wonder; Rhythm & Scale) (Dilafruz); • Introduction to Next Generation Science Standards (NGSS) (Sybil & Nancy); • Formative Assessment probes—putting research into practice (Sybil & Nancy) 	•
Day 3—June 20 Learning Gardens and Sustainability Education	<ul style="list-style-type: none"> • Principles of Learning Gardens & Sustainability Education (Biocultural diversity; Practical experience) (Dilafruz); • Experiential learning in place—science in the garden (Dilafruz, Sybil, & Nancy) 	•
Day 4—June 21 Learning Gardens and Sustainability Education	<ul style="list-style-type: none"> • Principles of Learning Gardens & Sustainability Education (Interconnectedness; Awakening the senses) (Dilafruz); • Inquiry in the garden—integrating the disciplines (Sybil & Nancy) 	•
Day 5—June 25 Next Generation Science Standards	<ul style="list-style-type: none"> • NGSS—integration, articulation, and learning progressions (Sybil); • Inquiry and Engineering design (Nancy); 	•

	<ul style="list-style-type: none"> • Appropriate technologies (?) 	
Day 6—June 26 Assessment FOR Learning	<ul style="list-style-type: none"> • Formative assessments—how to determine pre-conceptions and use that information to guide instruction (Sybil & Nancy) 	<ul style="list-style-type: none"> •
Day 7—June 27	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
Day 8—June 28	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
Monday, July 2 OR Friday, August 17	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •

Approximate Daily Schedule: [ssk3]

1:00-1:15—Arrive at Learning Gardens Laboratory; Welcome

1:15-1:45—Debrief morning experiences; share with afternoon-only group

1:45-3:00—Instructional activities

3:00-4:30—Group work on plans/units/articulation

4:30-5:00—Share out; evening reflection/ideas to ponder; next steps