Teaching Strategies for Diverse Learners

My Students Learn Differently—Now What?

Neil A. Knobloch, Ph.D.
2007 ACES Fall Teaching Symposium
Overview

• Learning Styles
  – Why?
  – What?
  – How?
• Learner-Centered Teaching Strategies

• Break

• LCT Examples in College of ACES
  – Active Learning
  – Inquiry Learning
  – Service Learning
• Practical Applications
• Lunch
• Concluding Remarks

Captain, Where are we headed?
Why are learning styles important?

• Acknowledge individual differences (Student-Students)
  – Students learn differently
• Accommodate differences (Teacher-Students)
  – E.g., 80% male instructors in ANSC, 80% female students in ANSC
• Identify one’s learning style (Student)
  – Self-assess the assets and liabilities of one’s learning style
  – Think about strategies that would help them be more successful
• Self-regulate one’s learning
  – Learning styles are not black/white, all or none
  – One can learn how to learn differently
Is this true today?

The study of individual and behavioral differences is the most germane discussion of the problems of education (Jensen, 1973, p. 1)
What is a Learning Style?

- 26 different styles (Biggs, 2001)
- Learning style
  - How one learns from and adapts to his/her environment (Gregorc, 1979)
  - The interaction of one’s behavior and personality as he or she approaches a learning task (Garger & Guild, 1984)
  - The way each person begins to concentrate on, process (thinking), internalize, and remember new and difficult academic content (Dunn & Dunn, 1999)
- Preference-based
  - Perceive (take in) stimuli
  - Process, order, and make decisions about using the stimuli (Feden & Vogel, 2003)
Match the Different Measures

- **B** Extroversion – Introversion
- **A** Active – Reflective
- **A, B** Sensing – Intuitive
- **C** Visual – Verbal
- **D** Concrete – Abstract
- **A** Sequential – Global
- **D** Sequential – Random
- **B** Judging – Perceiving
- **B** Thinking – Feeling

A. Felder-Silverman’s Indicator of Learning Styles
B. Jung’s Psychological Type-MBTI
C. VARK Modalities
D. Gregorc’s Mindstyles
Do learning styles exist?

It is clear that stable personality differences exist and can be measured, and they cohere in ways that allow taxonomy and theory (McCrae & Costa, 1994; cited in Snow, Corno, & Jackson, 1996, p. 245)
What do you see?

- One face or Two?
- Woman or Skull?

We perceive and process information differently
Ice Breaker

• Introductions

• Learning Style Indicator
  – http://tlt.its.psu.edu/suggestions/research/learning_styles.shtml
  – Stand up if you are… (see next slide)
Index of Learning Styles

• Active-Reflective
• Sensing-Intuitive
• Visual-Verbal
• Sequential-Global
How do people learn differently?

- Need Volunteers
  - Two tables of 4 to play Dutch Blitz
  - Two tables of 4 to play Set
  - Two tables of 6 to play Wheedle
  - One table of 2 to play Blink
- Ask one volunteer per table to read the rules, then play a practice round
- Play the game

Audience: Observe your peers play the game using one of the four learning styles
  - Felder-Silverman’s Indicator of Learning Styles
  - Jung’s Psychological Type-MBTI
  - VARK Modalities
  - Gregorc’s Mindstyles
- Debriefing – What did you observe?
How do you reach diverse learners?

• Focus on learning styles...use a variety of presentation methods, right?
  – Caveat!

• **Styles** are based on individual differences
  – Leads to a focus on a variety of presentation methods
    • And a de-emphasis on subject-matter concerns
  – Little attention given to difficult issues
    • Content selection
    • Content understanding
  – Mindless eclecticism in instructional style emphasizes packaging and delivery of content (Prawat, 1992)
Focus on Learning Approaches

- **Approaches** are based on learning tasks (content) and learning environment (context)
  - Focus on student thinking or sense making
  - Thinking is highly contextualized
- **Specific subject**…diversity of understandings students’ develop when learning domain-specific concepts
- **Specific setting**…how individuals interpret various context variables (norms of discourse)
Key Point

• The focus of the symposium is to purposefully use learner-centered teaching approaches to engage diverse learners based on the considerations of the:
  – Learners
  – Nature of content and learning tasks
  – Desired outcomes
  – Roles of teacher and learners
  – Approaches and strategies used to create contexts that engage learners
Teacher Preparation for New Faculty

BREVITY

HERE’S THE KEY TO THE CITY. NOW REMEMBER TO WATER THE PLANTS, AND TRY AND BRING IN THE MAIL ONCE A WEEK.

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What is learner-centered teaching?

• Students construct knowledge based on
  – Applying concepts
  – Solving problems that are relevant to students’ experiences
  – Performing authentic learning tasks (Knobloch & Ball, n.d.)
Five principles of LCT

- **Five principles** (Weimer, 2002)
  - Balance of Power
    - More democratic and egalitarian
  - Function of Content
    - Less on covering it, more on understanding it
  - Role of the Teacher
    - Less on delivery, more on asking questions and uncovering assumptions
  - Responsibility for Learning
    - Independent, autonomous learners
  - Evaluation Purposes and Processes
    - Promotes learning, de-emphasis on grades
LCT Assumptions

• Meaning is created from experience
  – Is grounded in real-life situations
• Encourages participation
  – Creativity and discovery in and outside of the classroom
• Multiple sources of knowledge
  – Creating and forming concepts, thinking critically, and solving problems
LCT Approaches

• Experiential or Authentic Learning
  (Dewey, 1938; Knobloch, 2003; Newmann et al., 1996)
  – Active Learning  (Bonwell & Eison, 1991)
  – Inquiry Learning  (Bransford, Brown, & Cocking, 1999)
  – Context-Based (Service) Learning
    (Hansman, 2001)
Neil’s Diamond

Teacher-Directed

Lecture
&
Class Discussions

Thinking Individually

Active Learning Technology & Stories

Thinking Socially

Active Learning Cooperative Learning

Learner-Centered

Inquiry Learning

Service Learning
Active Learning

• “Anything that involves students in doing things and thinking about the things they are doing” (Bonwell & Eisen, 1991)
  – Engaging students to think at higher levels through purposefully created well-designed (classroom) activities

• Teaching Methods that make learning…
  – Visual…realia & technology
  – Verbal…story-telling
  – Social…cooperative group learning & discussions
  – Assessment-based…real-time assessments
Inquiry Learning

• Scientific method of inquiry as a means to study a problem in depth
  – Contextualized, ill-structured problems to find meaningful solutions and concepts
  – Inductive approach – in contrast assigning an application problem at the end of a conceptual unit
  – Problems to motivate, focus, and initiate student learning

• Teaching Methods
  – Problem-Based Learning (Savery, 2006; Hmelo-Silver, 2004)
  – Case Study Method (Herreid, 2004)
  – Project-Based Learning (Polamn, 2000)
  – Simulations (Gredler, 2004)
Context-Based Learning

• Service Learning - Engaging students through thoughtfully-organized service in community-based environments outside of the classroom
  – Learn concepts
  – Reflect about the context/culture
  – Develop civic engagement

• Teaching Methods
  – Service Learning (Brown, 1998)
  – Place-Based Learning (Gruenewald, 2003)
  – Lab and Work-Based Learning
  – Internships & Practica
    • Cognitive Apprenticeships (Rogoff, 1990)
    • Situated Learning (Lave & Wenger, 1991)
    • Communities of Practice (Wenger, 1998)
## Considerations of LCT Approaches

<table>
<thead>
<tr>
<th>Approach</th>
<th>Active</th>
<th>Inquiry</th>
<th>Service</th>
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<tr>
<td>Driven by</td>
<td>An Engaging Teacher</td>
<td>A Problem to Solve</td>
<td>Real-world Context (outside of classroom)</td>
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<tr>
<td>Purpose</td>
<td>Higher-Level Thinking</td>
<td>Career Development</td>
<td>Personal Development &amp; Empowerment</td>
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<tr>
<td>Level of Student Engagement</td>
<td>+</td>
<td>++</td>
<td>+++</td>
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<td>Best Used for Course</td>
<td>Content Delivery (beginning)</td>
<td>Content Application (middle)</td>
<td>Contextual Application (end)</td>
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<td>Curriculum Design</td>
<td>100-200 level Survey Courses</td>
<td>300-400 level Discipline Specific Courses</td>
<td>300-400 level Capstone Courses</td>
</tr>
</tbody>
</table>
What do students say about learner-centered teaching?
Student Perceptions of LCT by Approach ($N = 357$)

- Interpersonal Relationships
- Adapts to Class Needs
- Facilitates the Learning Process
- Provides for Individual and Soc. Lrng Needs
- Encourages Challenge & Responsibility

Legend:
- Active
- Inquiry
- Service
Student Motivation and Cognitive Engagement by LCT Approach \((N = 357)\)
Thinking about Teaching

- **Teaching approaches and strategies** create **learning contexts and experiences** which **inform learning outcomes**
  - Learning tasks (McCombs & Whisler, 1997)
  - Roles of educator and learners (Weimer, 2002)
  - Learning environment and context (Young, 2003)
I think it’s time for a break.

“In an increasingly complex world, sometimes old questions require new answers.”
LCT Examples in the College of ACES
Active Learning

• Dr. Gary Kling
  – Associate Professor & NACTA Teacher Fellow
  – Department of Natural Resources and Environmental Sciences
  – Research
    • Development and evaluation of computer-aided instruction for landscape plant identification; culture and use, selection and improvement of woody landscape plants; use of pelletized landscape leaf waste as a preemergent herbicide carrier for nursery crop production
  – Courses
    • HORT 301 - Woody Landscape Plants I
    • HORT 302 - Woody Landscape Plants II
HORT 301 & 302

Identification, culture and usage of trees, shrubs and vines in the landscape
Acer saccharum

Sugar maple
Leaves:
Opposite, simple, orbicular, 3 to 6” long and across, 3- to 5-lobed, acuminate apex, cordate base, moderately deep sinuses; variable but generally dark green…
The imbricate, conical, 1/4" gray-brown buds are recognizably sharp-pointed. The axillary buds are about half as long as the terminal buds...
Botanical Terminology

- **Week 1**
  - Acuminate
  - Acute
  - Cordate
  - Doubly serrate
  - Elliptic
  - Incised
  - Lanceolate
  - Lobed
  - Lobulate
  - Oblanceolate
  - Opposite
  - Ovate
  - Serrate
  - Simple
  - Subcordate
  - Truncate

- **Weeks 2-3**
  - Alternate
  - Crennate-serrate
  - Elliptic
  - Emarginate
  - Impressed
  - Oblique
  - Oblong
  - Obovate
  - Orbicular
  - Oval
  - Rounded
  - Simple
  - Sub-opposite
  - Suborbicular
  - Whorled
Botanical Terminology Tutorial

The purpose of this tutorial is to introduce basic botanical terminology to students in horticultural and landscape classes to help them become more informed plant owners. Explore the various leaf and leaf identification features. Start by choosing one of the categories below. Relevant definitions, photos, and links to plants with similar features will be displayed.

**Leaf Characteristics**

- Leaf Apex
- Leaf Arrangement
- Leaf Base
- Leaf Margin
- Leaf Shape
- Venation

Download Assignment Instructions (pdf) (doc)

Glossary
A working glossary of terms seen

Available Illustrations (pdf)
Please login to use the tutorial and quiz.

NetID: gkling
AD Password: *********

Sign In

Not a UIUC member?
Take a quiz as our guest.

Take quiz as guest
Apex: The Tip of the Leaf

The leaf tip, or apex, is used to help describe the leaf. There are many species with leaves that differ only slightly by shape, but can be readily distinguished by their apexes.

Illustrations of Leaf Apices (.pdf)

**Acuminate**
- Sides curving conceivably upward and inward then tapering to a fine point on the leaf apex.

**Acute**
- An angle that is less than 90° with straight lines and having a point on a leaf apex.

**Emarginate**
- The apex of the leaf is notched towards the petiole at the middle.

**Mucronate**
- Leaf apex tipped with short abrupt point on midvein.

**Obtuse**
- Rounded leaf margin, greater than 90° at apex.

**Rounded**
- Wide curved shape that is wider than Obtuse with less of a point, while not being so flattened as to approach Truncate.

**Truncate**
- Leaf base or apex is perpendicular to leaf petiole and relatively straight across.
Leaf Apex: Acuminate

Acuminate Leaf Apex

**Definition:** Sides curving concavely upward and inward then tapering to a fine point on the leaf apex.

**Description:** A Japanese Maple shows that each of the 5 lobes have acuminate apices.

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Sauce Magnolias

Magnolia x soulangeana
Magnolia × soulangiana
Saucer magnolia

Known for its showy pinkish purple saucer-like flowers, this small tree is one of the most popular magnolias in the landscape. There are many cultivars of this hybrid species whose parents are Magnolia denudata and Magnolia × soulangiana.

Habit: Rounded to broad-rounded, low-branching, multi-stemmed
Size: 20-30' high
Texture: Medium
Hardiness: Zone 5a USDA
Family: Magnoliaceae

(c) 2002 Gary J. Kling
The Importance of Leaf Arrangement

Leaf arrangement is one of the first steps in helping to narrow down the options of woody plant identification. There are two types of arrangement that are usually discussed, arrangement of leaves at a node, and arrangement of leaves along the stem. Here we are concerned with arrangement of leaves at a node.

Leaf Arrangement Illustration (pdf)

**Alternate**
Leaves or Stems situated one at a node. Leaves can alternate in a distichous pattern along only two sides of the stem.

**Opposite**
Leaves appear directly across from each other arising at one node.

**Subopposite**
Leaves appear near opposite but not exactly opposite at a node without a fascicle.

**Whorled**
Three or more leaves arising at a node.
Veins of Leaves

Often veins follow the shape of the leaf. They can curve along the leaf following the margin, or they can break the margin and cause the leaf edges to end in fine points, bristles, or spines. The veins can provide interesting textures to the leaf surfaces. This helps in describing the plant and in enjoying its beauty.

As with many of the leaf characteristics, leaf veins can display multiple characteristics such as having both impressed and reticulate veins.

Illustration of Leaf Venation(pdf)

**Dichotomous**
Veins extend from a common point forming a “Y” pattern fanning out. Also means divided into two. Such as ‘dichotomous key’.

**Impressed**
Tissue near veins appear to pucker, giving veins a sunken or embossed appearance. Appearing to be pressed into the leaf.

**Palmate**
Several primary veins of approximately equal size radiating from a common point like fingers on a hand.

**Parallel**
Veins that run the length of a leaf and may come together at the leaf tip.

**Pinnate**
A leaf with a prominent midvein and secondary veins running along both sides of the midvein forming a ladder or v-pattern.

**Reticulate**
Veins forming a net-like pattern on the leaf.
The Importance of Leaf Shape

Knowing the shape of a leaf can help easily identify a woody plant. There are many ways to describe a leaf's shape, listed here are some of the more common terms:

Illustrations of Leaf Shapes (pdf)

- Absent-shaped
- Cordate
- Detalled
- Elliptical
- Facetate
- Flabellate
- Lancolate
- Linear
- Oblanceolate
- Obovate
- Ovate
- Ovate-oblong
- Oval
- Ovate-lanceolate
- Pinnate
- Perfoliata
- Pinnatifid
- Reticulate
- Scalloped
- Spatulate
The Mystery of Margins

Sometimes there are subtle differences in leaf margins and, more often than not, leaves display multiple characteristics. Many of the species species have serrations only at the tips while the rest of the leaf is entire. Such leaves can be hard to describe with a single word.

Illustration of Leaf Margins (pdf)

- Crenate
- Dentate
- Doubly-serrate
- Entire
- Incised
- Involute
- Lobed
- Lobulate
- Revolute
- Serrate
- Serrulate
- Sinuate
- Spinose
- Undulate
Leaf Bases

The leaf base consists of the bottom of the leaf where the leaf attaches to the petiole.

Illustrations of Leaf Bases (pdf)

Acute
An angle that is less than 90° with straight lines and having a point. This can be found in leaf apex or base.

Attenuate
Leaf tissue tapers down the petiole (toward the base) to a narrow base always having some fleshy leaf on either side of the petiole.

Auriculate
Ear-like shaped leaf base(s) attached to petiole.

Cordate
Heart-shaped leaf base with the notched part at the base of the leaf.

Cuneate
Narrow wedge-shaped leaf base tapering to a point at the petiole.

Oblique
Unequal leaf bases, pointing, one side longer, wider or rounder than the other.

Rounded
Smooth curve forming part of a circle.

Truncate
Leaf base or apex is perpendicular to leaf petiole and relatively straight across.
### Botanical Terminology Quiz History

The purpose of this tutorial is to introduce basic botanical terminology to students, using selected visual and textual examples to help describe and identify nonwoody plants. Select the section you wish to review, start by choosing one of the categories to the left. See definitions, photos, and links to plants with similar features.

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<th>Total Correct</th>
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Notes about this quiz.
Botanical Terminology Quiz

The purpose of this tutorial is to introduce basic botanical terminology to students using verbal and visual examples to help describe and learn about plant material. Explore the various helpful identification features. Start by choosing one of the categories to the left. See definitions, photos, and links to plants with similar features.

Correct!

What is the Leaf Arrangement of the plant shown here?

- Subopposite
- Whorled
- Opposite
- Alternate

Submit
Botanical Terminology Quiz

The purpose of this tutorial is to introduce basic botanical terminology to students, using verbal and visual examples to help describe and learn woody plant material. Explore the various helpful leaf identification features. Start by choosing one of the categories to the left. See definitions, photos, and links to plants with similar features.

Correct!

The *Quercus robur* shown in this photo illustrates what type of Leaf Base?

- [ ] Attenuate
- [ ] Cuneate
- [ ] Auriculate
- [ ] Rounded
- [ ] Cordate

Submit
Botanical Terminology Quiz

The purpose of this tutorial is to introduce basic botanical terminology to students using verbal and visual examples to help describe and learn woody plant material. Explore the various leaves by clicking on choosing one of the categories to the left. See definitions, photos, and links to plants with similar features.

Wrong! The correct answer was Auriculate.

Amur Maple demonstrates what Venation feature?

- Parallel
- Dichotomous
- Impressed
- Reticulate
- Pinnate

Submit
Welcome, gkling!

Begin New Quiz
Plant Tutorial
Quiz History

Quiz Results
1 2 3 4 5 6 7 8 9 10
4 / 5
What is the Leaf Arrangement of the plant shown here?
- Whorled
- SUBOPPOSITE
- Opposite
- Alternate

What is the Leaf Arrangement of the plant shown here?
- Subopposite
- WHORLED
- Opposite
- Alternate

The Quercus robur shown in this photo illustrates what type of Leaf Base?
- Attenuate
- Cuneate
- AURICULATE
- Rounded
- Cordate

Anur Maple demonstrates what Venation feature?
- Parallel
- Dichotomous
- Impressed
- Reticulate
- PINNATE

The Pсосесus delaviscis shown in this photo illustrates what type of Leaf Margin?
- Revolute
- Dentate
- Sinuate
- CRENATE
- Doubly-serrate

Corneliancherry Dogwood demonstrates what Leaf Base feature?
- Auriculate
- ROUNDED
- Truncate
- Curved
- Alternate
Botanic Project Administration

Manage Categories
Manage Photographs
Manage Questions
Manage Users
Take Quiz
Quiz Results
Botanial Tutorial

Recent Activity

This table lists all users of the site within the last 60 minutes and displays how many pages each user has viewed.

<table>
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<tr>
<th>Username</th>
<th>Page Views</th>
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Pre-test

- This was a 10 question, multiple-choice quiz to establish a baseline of students current understanding of the terminology we wanted to cover.

- Highest score for the whole class was 4 out of 10

- 16% average
Post-test for Retention

- 24 question test dried samples mounted to cards with questions printed directly on them.
- No vocabulary cue was given.
- Testing long-term ability to retain information (after 2 months or 9 weeks).

40.4% Leaf collection
49.0% Online tutorial

#11 What botanical term describes the leaf apex?
## Results

### Table 1. Group comparison using Cohen’s *d* for Effect Size

<table>
<thead>
<tr>
<th>Knowledge Tests</th>
<th>Online Tutorial</th>
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<th>Leaf Collection</th>
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### Motivation

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<th>Leaf Collection</th>
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<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
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<td>5.11</td>
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<tr>
<td>Responsibility for Learning</td>
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<td>5.13</td>
<td>1.18</td>
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<td>1.33</td>
<td>3.79</td>
<td>1.25</td>
<td>.19 (trivial)</td>
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</tbody>
</table>
Botanical Terminology Website

http://plants.nres.uiuc.edu/

Authors:
Laura Hayden
Gary Kling
Josh Potts
Inquiry Learning

- Dr. Prasanta Kalita
  - Associate Professor & Distinguished Teacher/Scholar
  - Department of Agricultural and Biological Engineering
  - Research
    - Hydrology, watershed quality, modeling erosion and sediment control
  - Courses
    - ABE 221 - Agr and Bio Engineering I
    - ABE 456 - Land and Water Resources Engineering
    - ABE 498 - Non Point Pollution Processes and Control
    - ABE 396/397 - Independent Study/UG Research
    - ABE 599 - Thesis Research
    - ACES 100 - Contemporary Issues in ACES
Inquiry Learning

• Definition: Student learning through investigation of complex problems

• Few teaching strategies:
  • Discussion or dialogues
  • Real-world problem-based
  • Case studies
  • Simulations
  • Independent study/research
  • Group project
  • And others (NOT TRADITIONAL LECTURING)

• Two teaching strategies I use most often….
  • Real-world Problem Based Learning – Small groups
  • Independent study/research – Individual or groups
Example 1

• Real-world problem (short term or semester long)
• *Stream-bank restoration at Camp Atterbury in Indiana*
  • Define the problem, develop questions
  • Develop hypothesis, visit site, investigate, refine questions
  • Develop solution, alternatives, and estimate cost
  • Make reasoned judgments, adjust solutions
  • Write draft, receive critiques, print final report, present results
  • Implementation
Example 2

• Research-based learning (semester or yearly, stepwise)
• *Bioresidiation of agricultural chemicals from subsurface drainage outflows*
  • Develop research questions and hypothesis
  • Conduct literature review
  • Develop research proposal and secure funding
  • Design experiments, buy materials, and conduct research
  • Analyze results, provide-reasoned judgments
  • Develop conclusions, write report and present results
Students

• What motivates them to learn?
  • Questions for which they need to find an answer or answers
  • Curiosity and interest drive them to learn

• Steps of learning process
  • Challenge
  • Frustration
  • Finally, satisfaction

• Outcomes
  • Solution to a problem – confidence building
  • Adjusting and refinement of judgments
  • Develop critical thinking by analysis
  • Develop responsibility to do and learn
  • Intellectual growth
  • Prepares them for real-world job market
Service Learning

- Dr. Tony Endress
  - Professor
  - Department of Natural Resources & Environmental Sciences
  - Research
    - Restoration ecology, assembly of plant communities, invasion biology, impacts of ungulate herbivory on plant community structure, and physiological ecology
  - Courses
    - NRES 285 – Restoration Ecology Practicum
    - NRES 294 – Resident Internship
    - NRES 419 - Environment and Plant Ecosystems
    - NRES 420 - Restoration Ecology
    - NRES 512 - Discussions in Natural Resources and Environmental Sciences
Service Learning

• Context + Process → Engagement
• Teaching Perspective
  • Developmental (from student’s view)
  • Professional socialization (apprenticeship)
• Teaching Challenges
• Teaching Strategies
  – Authentic project
  – Power of group
  – Reflective practice
  – Feedback
  – Field vignettes & case studies
Power of the Group

- Team composition
- Project simulation
- Accountability
- Responsibilities outside of project

The Situation

Your organization has just assigned you to a newly formed task team which is taking over a secret project previously being handled by Research and Development. Your entire team has been assigned responsibility and authority to design a plan for managing the project, and then—after top management has reviewed and accepted your plans—carry out the project.

Note: you have been told nothing about the project so far other than it is expected to grow to sizable proportions, requiring additional people.

The Challenge

Despite the lack of information regarding the project, your team must now design a preliminary plan for managing it. On the next page is a list of 20 Management Activities (A through T) arranged in random order. Your task is to arrange these activities according to the sequence you would follow in planning, organizing, implementing, and controlling the project. This sequence will be reviewed by top management before you are authorized to begin work on the project.

Management Activities

<table>
<thead>
<tr>
<th></th>
<th>Step 1 Individual Sequence</th>
<th>Step 2 Team Sequence</th>
<th>Step 3* Suggested Sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Find qualified people to fill positions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Measure progress toward and/or deviation from the project's goals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Identify and analyze the various job tasks necessary to implement the project.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Develop strategies (priorities, sequence, timing of major steps).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Develop possible alternative courses of action.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Deliver appropriate consequences for individual performance.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Reflective Practice

- Project records
- Reflective prompts
- Broader meaning

Learning is an evidence-based *journey*
Contributing Within the Context

- Bridging Knowledge
- Feedback
  - Within group
  - Peer
  - Instructor
  - Client
  - Expert
  - Public Presentation
  - Practitioner jury
  - Peer performance evaluation
Teaching Strategies

• Student-centered learning
  – Know your
    • Students
    • Personal teaching perspective
    • Various roles

Enable the learning process
Summary

• Strategies to facilitate student learning
  – Adapt to students’ level of understanding & ways of thinking
  – Address authentic problem
  – Require teamwork, responsibility, & effective communication
  – Incorporate input & feedback from professionals & peers
  – Generate implemented outcomes in the community

*Students learn, community benefits*
Questions?
Practical Applications ACT

- **Groups**
  - Introductory Survey Course
  - Upper-Level Undergraduate, Discipline-Specific Course
  - Large Classroom (>150 students) Course

- **Instructions**
  - Select a course
  - Clarify the purpose and goals for the course
  - Identify the big ideas (concepts) and topics that should be taught in the course
  - Identify the teaching strategies and learning activities that would be used to meet the goals for the course and reach all types of learners
  - Identify procedures that will be used to assess student learning and determine if the goals were met
  - Outline how you would get students to buy-in and be successful in a course that engages them using learner-centered teaching strategies

- **Share Ideas**
## Course Design WS

<table>
<thead>
<tr>
<th>Learning Goals</th>
<th>Learning Activities</th>
<th>Student Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understand and remember key concepts, terms, and relationships</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Know how to use the content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Be able to relate this subject to other subjects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Understand the personal and social implications of knowing about this subject</td>
<td></td>
<td></td>
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<tr>
<td>5. Care about the subject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Know how to keep on learning about this subject after the course is over</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fink, 2003
## Possible Course Structures

<table>
<thead>
<tr>
<th>Approach</th>
<th>Large Course</th>
<th>Introduction</th>
<th>300-400 Discipline-Specific</th>
<th>Capstone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>75%</td>
<td>65%</td>
<td>45%</td>
<td>15%</td>
</tr>
<tr>
<td>Inquiry</td>
<td>20%</td>
<td>25%</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>Service</td>
<td>5%</td>
<td>10%</td>
<td>15%</td>
<td>65%</td>
</tr>
</tbody>
</table>
Concluding Remarks

- Observations
- Key Points
- Resources
- Evaluation

Please register in the LCT Network
http://lct.aces.uiuc.edu
Have a Great Year!

FYI:  
http://lct.aces.uiuc.edu

Contact:  
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(765) 494-8439

Thank You