
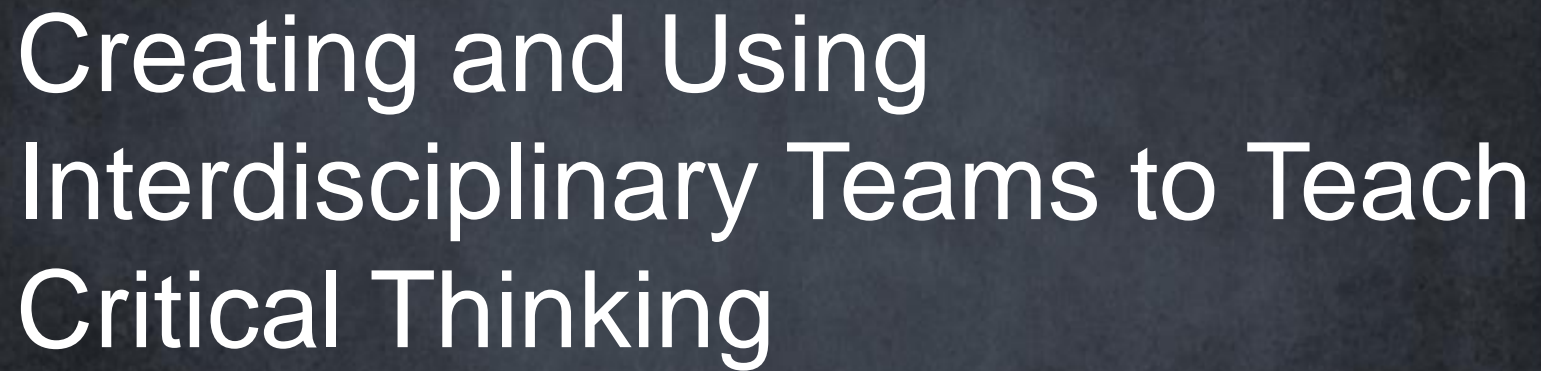




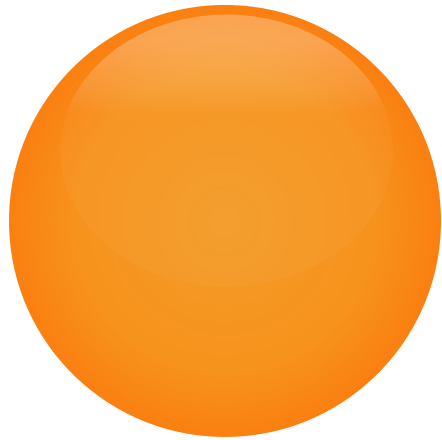
Dr. Ellen Vincent 



Creating and Using Interdisciplinary Teams to Teach Critical Thinking



CT² Summer Faculty Institute, Clemson University
June 6, 2018



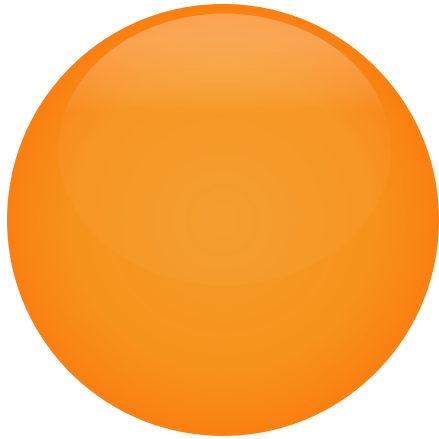
CRITICAL THINKING IS AN ANCIENT RICH CONCEPT

The practice and concepts are 2500 years old. 

<http://criticalthinking.org/pages/defining-criticalthinking/766>



HISTORY



IT CAN BE TRACED IN THE WEST TO ANCIENT GREECE WITH ITS SOCRATIC METHOD AND IN THE EAST TO ANCIENT INDIA WITH THE BUDDHIST KALAMA SUTTA AND ABHIDHARMA LITERATURE.

<http://openmindspace.org/CriticalThinking>

Socratic method

- Father of philosophy.
- **Questions** were asked to determine logic, ethics, fairness, and constancy.
- Inspired the scientific method (develop a hypothesis and then investigate validity.)

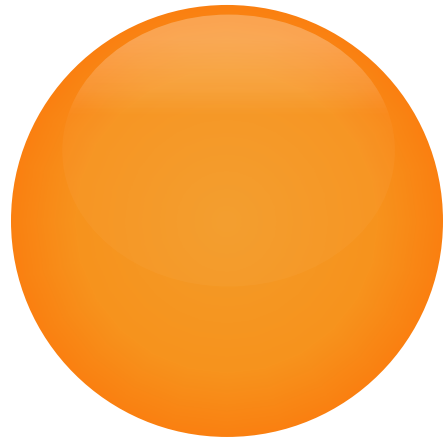


<http://en.wikipedia.org/wiki/Socrates>

<https://plato.stanford.edu/entries/socrates/>

[ps://www.amazon.com/SOCRATES-Translated-Introductory-Huntington-Illustrations/dp/B01DRMUZ8Y](https://www.amazon.com/SOCRATES-Translated-Introductory-Huntington-Illustrations/dp/B01DRMUZ8Y)

Sculpture by Constantin Brancusi



CRITICAL THINKING IS AN INTELLECTUALLY DISCIPLINED PROCESS

<http://criticalthinking.org/pages/defining-criticalthinking/766>



Critical thinking

- Critical thinking happens when we think about how we think... we track our own thoughts and decision making processes (Vincent, 2013).
- Critical thinking...the awakening of the intellect to the study of itself (Scriven & Paul, 1987 from the Foundation for Critical Thinking Defining Critical Thinking at <http://www.criticalthinking.org>).



<http://sandykumskov.com/images/think.jpg>

Critical thinking intellectual traits

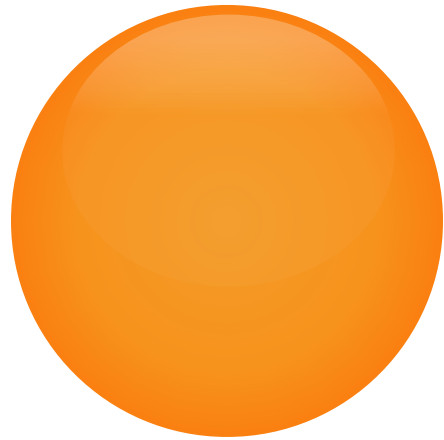
- Intellectual humility
- Intellectual autonomy
- Intellectual integrity
- Intellectual courage
- **Intellectual empathy**
- Intellectual perseverance
- Confidence in reason
- **Fairmindedness**



<https://www.pinterest.com/pin/322148179572194734/>

The Foundation for Critical Thinking

<http://www.criticalthinking.org/pages/critical-thinking-where-to-begin/796>



DEFINING INTERDISCIPLINARY

<http://criticalthinking.org/pages/defining-criticalthinking/766>

Definitions

The terms **multidisciplinary**, **interdisciplinary** and **transdisciplinary** are increasingly used in the literature, but are ambiguously defined and interchangeably used.

Dictionary definitions

Multidisciplinary: Combining or involving several academic disciplines or professional specializations in an approach to a topic or problem.

Interdisciplinary: Relating to more than one branch of knowledge.

Transdisciplinary: Relating to more than one branch of knowledge; interdisciplinary.

<https://en.oxforddictionaries.com/definition/us/multidisciplinary>

<https://en.oxforddictionaries.com/definition/us/interdisciplinary>

<https://en.oxforddictionaries.com/definition/us/transdisciplinary>

Research definitions

- **Multidisciplinarity** draws on knowledge from different disciplines but stays within their boundaries.
- **Interdisciplinarity** analyzes, synthesizes and harmonizes links between disciplines into a coordinated and coherent whole.
- **Transdisciplinarity** adds knowledge and production from outside the academy to the multiple disciplines within the academy.

Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness. Choi CK, Pak, AW, 2006. <https://www.ncbi.nlm.nih.gov/pubmed/17330451>

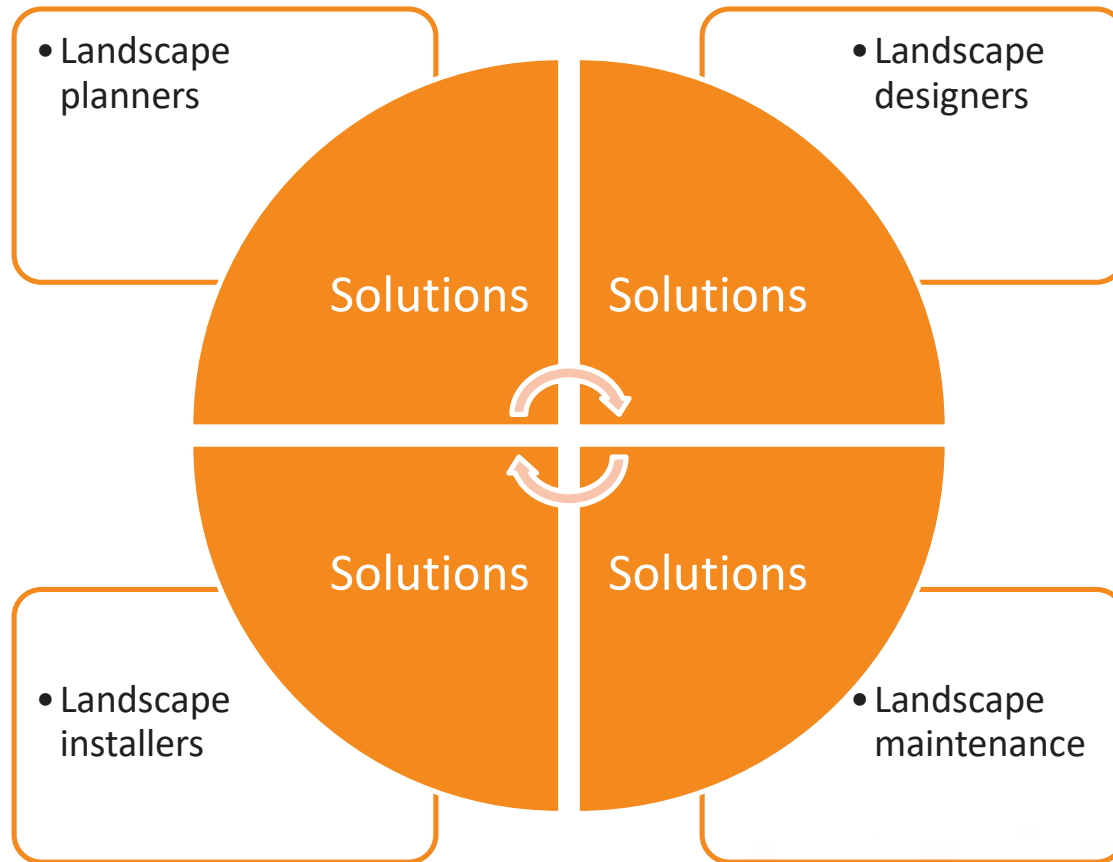
<https://sustainabledevelopment.un.org/content/documents/612558-Inter-%20and%20Trans-disciplinary%20Research%20-%20A%20Critical%20Perspective.pdf>

Academic/field applied definitions

- **Multidisciplinary** teams involve people from different disciplines.
- They agree to work as a team to create solutions for a specific issue/problem.
- Each discipline develops one or more solutions for consideration and presents these to the leader or the group for consideration.

From personal conversations between Dr. Vincent and Dr. Frank Fear

Multidisciplinary teams



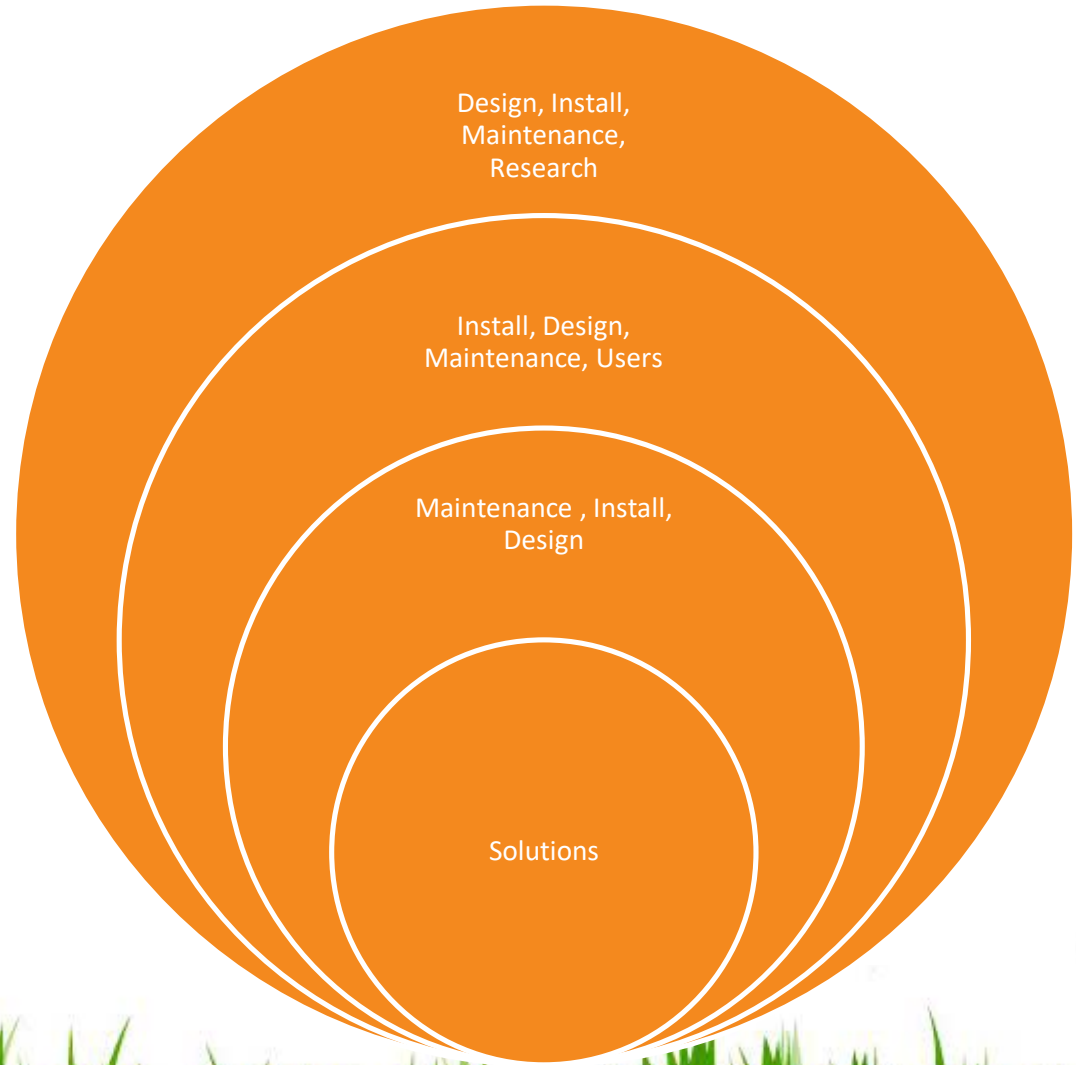
Academic/field applied definitions

- **Interdisciplinary** teams involve people from different and varied disciplines.
- They agree to work as a team to create solutions for a specific issue/problem.
- They are willing to **learn from the other team members and change their mind** about how to solve the issue/problem.

From personal conversations between Dr. Vincent and Dr. Frank Fear

Interdisciplinary teams

Discipline specialists and project leaders share information with each other and seek varied perspectives

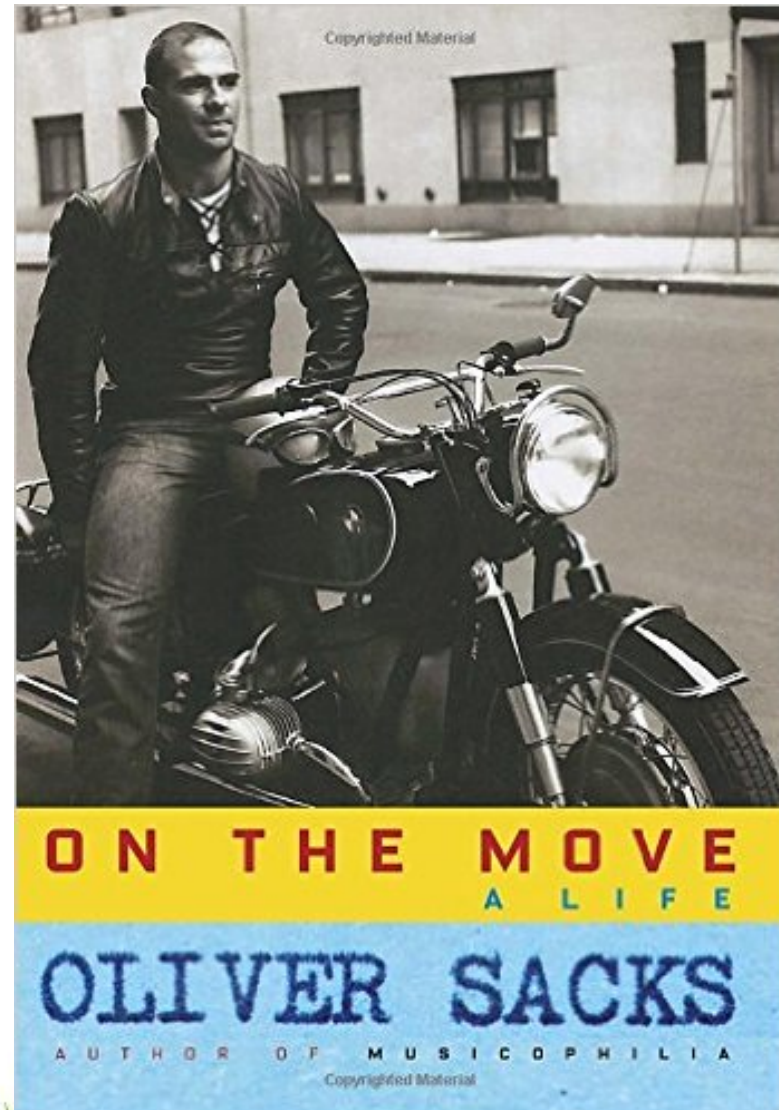


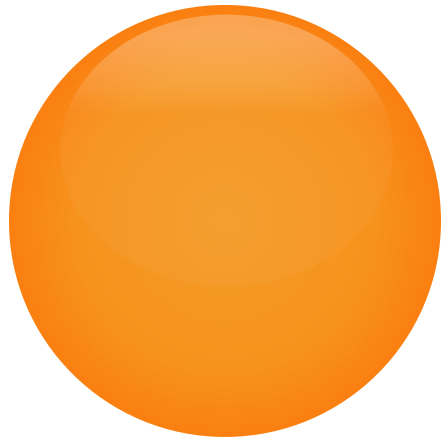
Academic applied definitions

Multidisciplinary	Interdisciplinary
Relevant disciplines involved	Varied yet relevant disciplines involved
Meets at least once then continues work within one's own discipline	During group meetings seeks to learn about the problem from other people's perspectives
Submits work to leader or group for consideration	Continues to meet with larger diverse group (or relevant portions of) while developing solutions
Makes changes based on feedback	Team members have capacity to listen deeply
	Team members are willing to change their mind based on new information

Interdisciplinary Communicator: Oliver Sacks

- British neurologist, practicing physician at New York University, and acclaimed author who explored the “mysteries of the brain”.
- Wrote case studies that looked for novel connections between science and the human condition.
- He perceived resilience and beauty where few dared to look.
- Author:
 - *On the Move: A Life* (2015) Amazon \$15.68
 - *The Mind’s Eye* (2011) Amazon \$11.05
 - *Musicophilia: Tales of Music and the Brain* (2008) Amazon \$9.36
 - *The Man Who Mistook His Wife for a Hat* (1998) Amazon \$9.51





WHY USE INTERDISCIPLINARY WORK GROUPS IN THE CLASSROOM?

To contribute to positive solutions in the workplace and world



Sustainability defined



Gro Harlan Brundtland, Chair of World Commission; Former Prime Minister of Norway

<https://www.britannica.com/topic/Brundtland-Report>

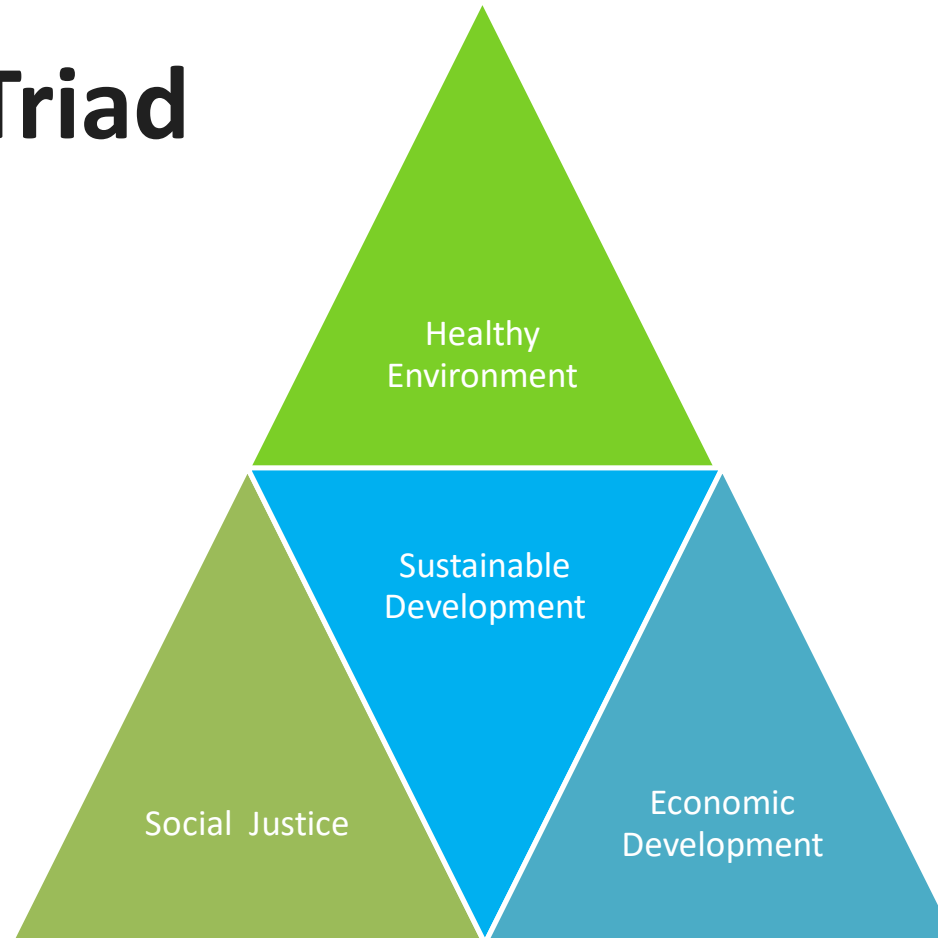
https://en.wikipedia.org/wiki/Our_Common_Future#/media/File:Our_Common_Future_book_cover.gif

5/29/2018

20

Sustainable Development

Issue Triad



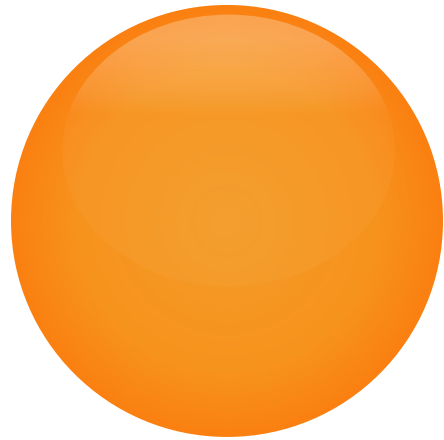
“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” (1987, p. 8).

Shared leadership

The
Elders
meet in
2007



http://desertpeace.files.wordpress.com/2009/09/the_elders.jpg



CREATING INTERDISCIPLINARY TEAMS IN THE CLASSROOM

Fair, random



Tool: Form mixed major teams

- *Form interdisciplinary teams by mixing majors*
 - *Sort by major, shuffle cards, student rep from various majors select cards for team in full view, no personal names visible*



Tool: Group exercises

- *Provide clipboards and worksheets to professionalize the experience*
- *Worksheets contain space for name and major*



Tool: Group exercises

Group exercise: Sustainable Communications | HORT

Name	Major
1 Brittany Lapple	Architecture
2 Rachel Edwards	Hort
3 Jay Gervais	Civil Engineering
4 Austin Allen	LAHC

State a claim (clear and obvious) made by authors (like a hypothesis) about engagement and/or dialogue:

In order for a group to be successful^{in a dialogue setting} every member must be included and energetically engaged, through maintenance and facilitation

Validity checks (search for truth) using three methods/sources:

1-Experiential (personal or others)

Multi- or interdisciplinary work with conflicting or multiple opinions. (e.g. lab work, architecture projects)

2-Authoritative (professors, .gov; .edu; non-profit organizations)

A contractor who has to deal with and help

2-Authoritative (professors, .gov; .edu; non-profit organizations)

A contractor who has to deal with and help converge ideas from a number of different professions on a daily basis.

3-Disciplined (peer reviewed lit, published surveys and experiments)

Published peer reviewed article on the subject of communication and engagement.

Alternate views/perspectives

Identify people or organizations who may disagree with the claim.

State the source of the view.


- A CEO who wants to have the final say on decisions, despite other opinions
- Control oriented people in positions of power
- A tenured professor who doesn't have Intellectual humility

HORT 3080 Group exercise: Sustainable Garden | CT2

Name	Major	Name	Major
1 Laurence Gressette	LA	3 Raye A.	EA: Hort
2 Austin Allen	LA	4 Anna Fisher	Hort

Viewpoint from your discipline

Beliefs/claims (clear and obvious) of authors (like a hypothesis):



Be mindful of design process in working with other disciplines.

Methods/sources for checking validity

Experiential (personal or others):

How we feel and know about the claim through our own LA and design experience.

Authoritative (professors, .gov; .edu; non-profit organizations):

Ask professors about personal experience working w. collaboration / local consultants / viewpoints from ^{college} books

Disciplined (peer reviewed lit, published surveys and experiments):

Clemson extension for published surveys.

ASK professors about personal experience working w
collaboration / local consultants / viewpoints from books college

Disciplined (peer reviewed lit, published surveys and experiments):

Clemson extension for published surveys.

Multiple views: Perspectives (your own or imagined others) that do not support your claim. State the source of the view.

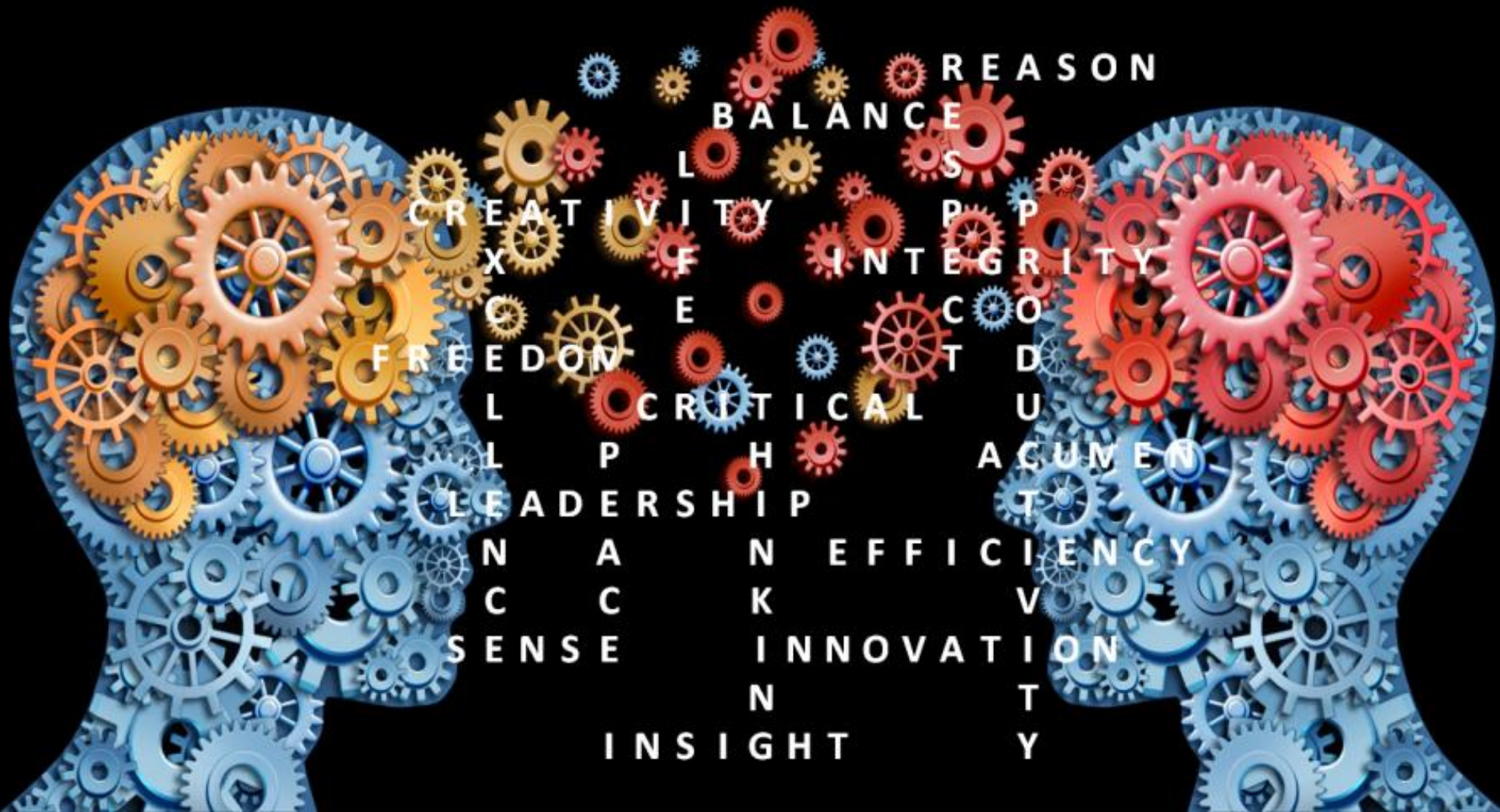


Prestigious design artists in different states or countries.

-they have been so highly regarded, they have "faith" in their design and don't plan to look and listen to outside sources.

Use reverse side if needed





Critical Thinking Visual Essay Items

1. Identify a claim/belief/assumption from the readings or class that personally connect with.
2. Investigate the validity of the claim/belief/assumption.
3. Explore or look at the issue using multiple viewpoints.
4. Reflect from your past and tell the story.
5. Conclude with personal *informed* actions.
6. Add an image that supports your search.
7. Cite the image.



Sustainable Landscape Garden Design, Installation, & Maintenance HORT 3080

**HORT
CT²**

Critical Thinking Protocol in Visual Essay

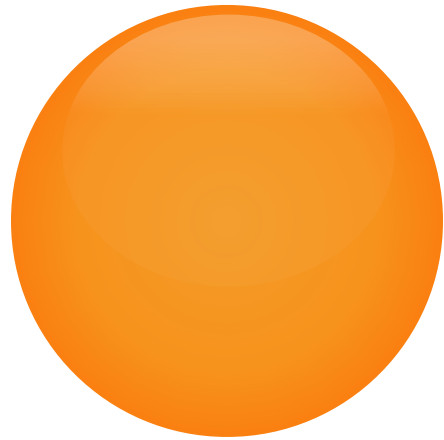
Grading rubric: 100 points total

Each essay should contain a header that includes: Name; Class title; Date; CT2 Visual Essay

Save the essay with your last name and the essay # in the saved file name: e.g. Vincent_CT2 essay1

Critical Thinking Essay Item	Points
Identify a claim/belief/assumption from class or readings that you personally connect with: Identify and clearly state a specific claim/belief/assumption that you perceive. Include the source(s) you are using in the text. Do not use quotes-use your own words.	10
Investigate the validity of the claim/belief/ assumption: How can you check the author's claim/belief/assumption for accuracy and validity? Be specific and use a minimum of two methods to determine the legitimacy of the author's claims. Experiential (personal experience); authoritative voices (professors, .gov, .edu sites); disciplined (peer reviewed literature; surveys; fact checks; repetition of experiments, etc.)	20
Explore alternate possibilities/conclusions using multiple viewpoints: What other possible perspectives, explanations, or interpretations can you suggest for a deeper understanding of the claim/belief/assumption? State the source of the view.	10
Reflection from your past: Using your own personal experiences share a story from your past that was triggered by the claim/belief/assumption. Make it vivid so the reader feels as though they were there with you.	10





INTERDISCIPLINARY COMMUNICATION TOOLS

Engagement, dialogue 

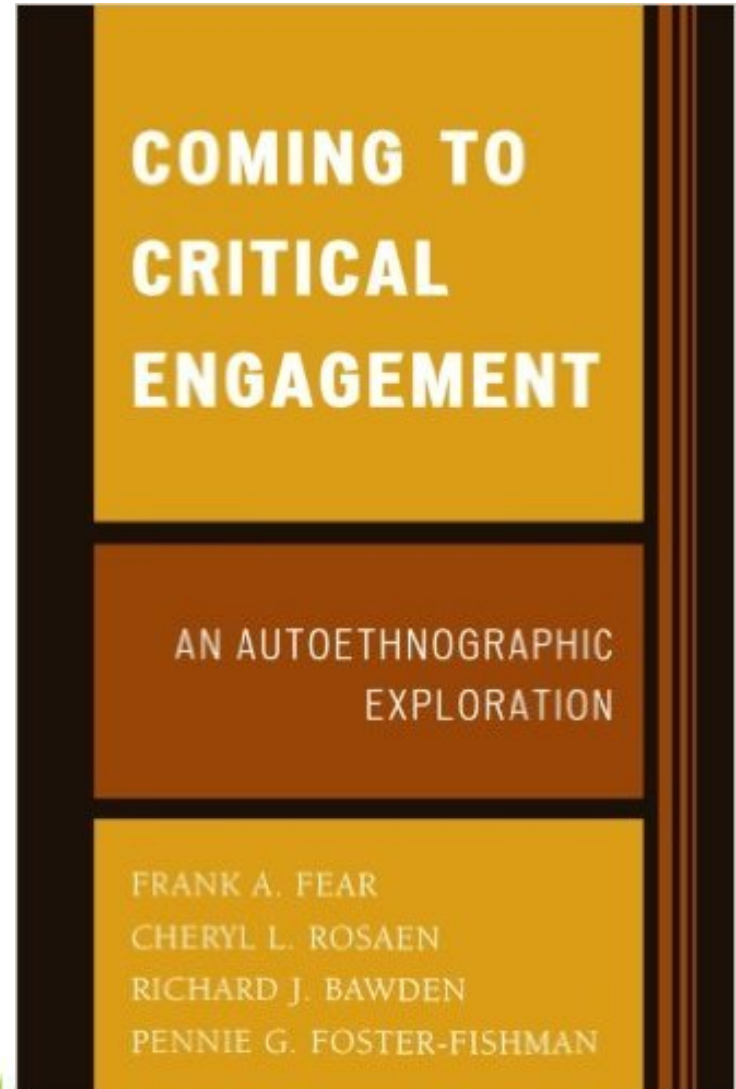


Engagement-Dr. Frank Fear



**Dr. Frank Fear, Professor Emeritus
Michigan State University,
engagement author; Kellogg
consultant**

Amazon \$49.88



<http://www.amazon.com/Coming-Critical-Engagement-Autoethnographic-Exploration/dp/0761834710>

<https://www.laprogressive.com/author/frank-a-fear/>
<https://www.amazon.com/Coming-Critical-Engagement-Autoethnographic-Exploration/dp/0761834710>

Engagement

- *Critical*: conveys the central importance of treating **self and subject as text to be examined** (Introduction p. xiii)
- *Engagement*: is a stance which is expressed in **answers to core questions**: Why do you engage? With whom do you engage? Towards what tend do you engage? How do you engage? (p. xiii)
- *Communities of practice* are grounded in a theory of engaged learning: learning is social: members learn with others; from others, and through others...Engagement involves trust and shared leadership (Introduction, p.xvi)

Fear et al., 2006. *Coming to critical engagement*. University Press of America

Engagement

- ...“Grounded in an ethos of **mutuality, respectfulness, and stewardship**, proceeding through dialogue, and fostering inclusive well being.”
- Engagement is a way of being- both on campus and off-energized by the norms of engagement.
- Framed this way, engagement becomes a leadership and management practice.--*Dr. Frank Fear*

Engagement

- “Engaged learning is an approach, an expression of being, a leadership ethic, and a way for scholars, practitioners, and administrators to connect otherwise diverse activities thematically, coherently, and meaningfully.”

» -Frank Fear et al., 2002. *A Model of Engaged Learning: Frames of Reference and Scholarly Underpinnings*. Outreach Scholarship Conference

Engagement

- Be a learner in your group rather than an **expert** Fear, F., et al. (2002). Experiencing engagement: **Stories from the field.** *Journal of Higher Education Outreach and Engagement*, 8(1), 59-74.
- If you are accomplished in a discipline or area consider yourself a specialist instead of an **expert** (Denny, personal communications, 2006).
- Stay open to outcome, i.e. allow your mind to **be changed** (Arriens, A., workshop, 2004).

Engagement

Dialogue is essential to successful engagement.



**COMING TO
CRITICAL
ENGAGEMENT**

AN AUTOETHNOGRAPHIC
EXPLORATION

FRANK A. FEAR
CHERYL L. ROSAEN
RICHARD J. BAWDEN
PENNIE G. FOSTER-FISHMAN

<http://www.amazon.com/Coming-Critical-Engagement-Autoethnographic-Exploration/dp/0761834710>

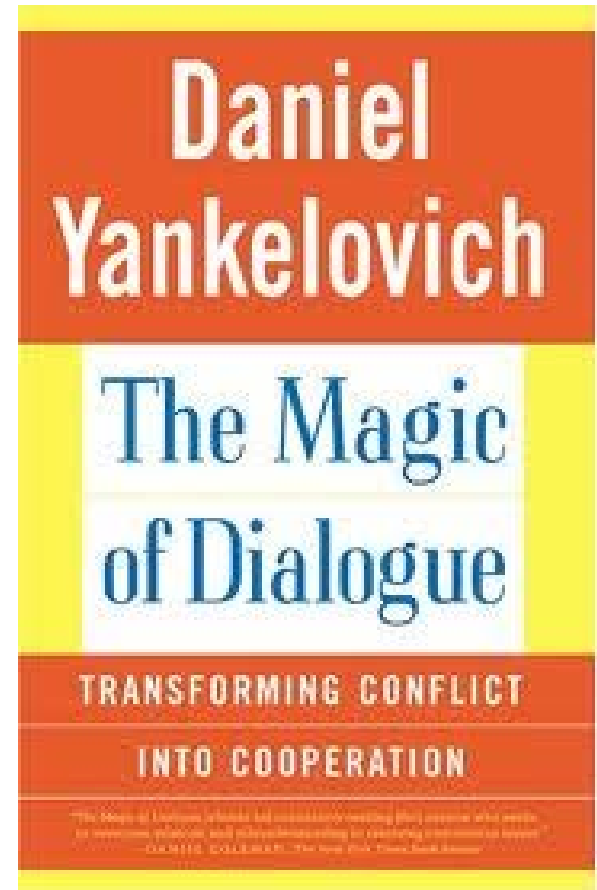
Dialogue: Daniel Yankelovich

<http://www.strategy-business.com/media/image/05309.jpg>



Daniel Yankelovich

- Graduate School of Arts and Sciences, Harvard University (Rantoul Fellow in Clinical Psychology)
- Director, UCSD Civic Collaborative, University of California at San Diego
- Recipient, Common Ground Book of the Year Award (for *The Magic of Dialogue*), 1999
- Trustee for 11 major firms & Board of Director on 7 major corporations



http://www.amazon.com/s/ref=nb_sb_noss_2?url=search-alias%3Dstripbooks&field-keywords=The+magic+of+dialogue

Amazon \$15.99

Dialogue: 3 core components

- Equality
- Empathetic listening
- Airing assumptions and not judging them (or the speaker)



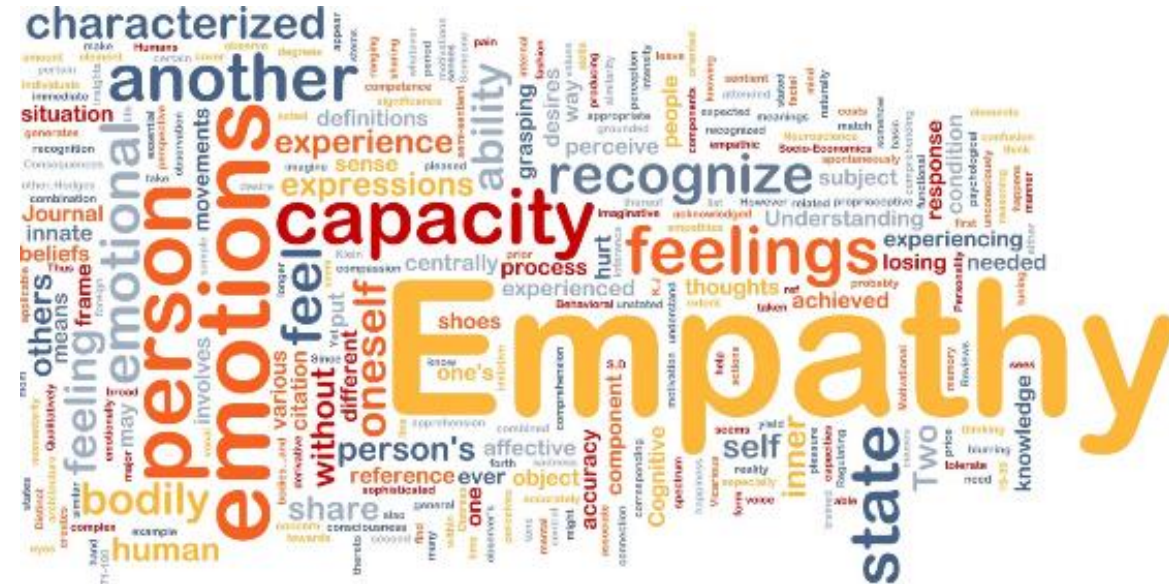
Photo: Brian Zopf

http://www.google.com/imgres?imgurl=http://www.publicagenda.org/files/images/pages/Yankelovich_Claremont_110808.jpg

Yankelovich, D. (1999). *The Magic of Dialogue*, p. 46. New York: Schuster

Dialogue

- (1) Equality: All participants are treated as equals. No arm-twisting, no pulling of rank, no overt or indirect attempt to influence.
- (2) Listening with empathy: Try to grasp each others viewpoint, even when they differ.



Dialogue

- (3) Bring assumptions into the open: Examine one's own and other participants assumptions. Once exposed (in the open) treat them with respect.

“When your deepest-rooted assumptions about who you are and what you deem most important in life are attacked, you react as if you were attacked personally.” —David Bohm

Yankelovich, D. (1999). *The Magic of Dialogue*, p. 46. New York: Schuster



<http://c.tadst.com/gfx/750x500/sunrise.jpg?1>



<http://globe-views.com/dcin/dreams/storm/storm-04.jpg>



Photo by Ellen Vincent

County Mayo, Ireland

Dialogue vs debate

Dialogue	Debate
Assuming many people have pieces of the answer and that together they can craft a solution.	Assuming that there is one right answer and you have it.
Is collaborative: participants work together toward common understanding.	Is combative: participants attempt to prove the other side wrong.
About exploring common ground.	About winning.
Listening to understand, find meaning and agreement.	Listening to find flaws and make counter-arguments.

Yankelovich, D. (1999). *The Magic of Dialogue*, pp. 39-40.
New York: Schuster

Dialogue vs debate

Dialogue	Debate
Revealing assumptions for reevaluation.	Defending assumptions as truth.
Reexamining all positions.	Critiquing the other side's position.
Admitting that others' thinking can improve on one's own.	Defending one's own views against those of others.

Yankelovich, D. (1999). *The Magic of Dialogue*, pp. 39-40.
New York: Schuster

Dialogue vs debate

Dialogue	Debate
Searching for strengths and values in others' positions.	Searching for flaws and weaknesses in other positions.
Discovering new options, not seeking closure.	Seeking a conclusion or vote that ratifies your position.

Yankelovich, D. (1999). *The Magic of Dialogue*, pp. 39-40.
New York: Schuster

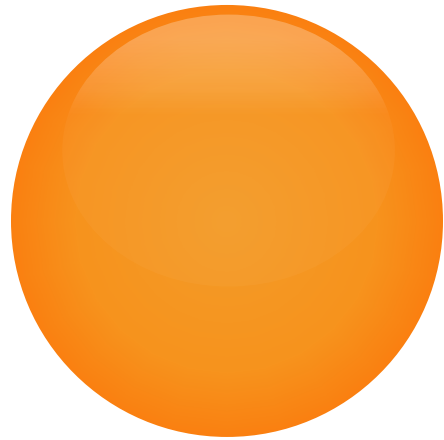
Dialogue vs debate group exercise

- When do you recall experiencing dynamic dialogue or debate?
- Share your recollection with your neighbor.



Community Garden Berkeley, CA

Photo by Ellen Vincent



EXIT SURVEY RESPONSES



Exit survey student responses

What one belief/thought has changed or altered as a result of taking this class?

- *“Listen to other people because they have opinions that matter.”* FORESTRY
- *“Being open to listen and plan with the landscape maintenance team during the planning stages.”* HORTICULTURE
- *“That all majors and disciplines are capable of working in a group and learning from each other.”* ANTHROPOLOGY

Exit survey student responses

What one belief/thought has changed or altered as a result of taking this class?

- *“I have become more open to others’ opposing viewpoints on controversial topics.”* AGED
- *“I learned to be open-minded. I have learned to look at things from a different perspective than just my own. There are 2 or more sides to every story.”* TURF

Exit survey student responses

What one belief/thought has changed or altered as a result of taking this class?

- *“I now use empathy when listening to other people’s viewpoints. I now look at a person’s viewpoint with a better understanding of how they feel about an issue.”* HORT

Exit survey student responses

What one belief/thought has changed or altered as a result of taking this class?

- *“Personally, my outlook to the overall design process has shifted to a more sustainable mindset. To get all parties involved in the design process from the beginning will save a lot of hassle on the back end of the install and maintenance.”* ARCHITECTURE

Exit survey student responses

What one belief/thought has changed or altered as a result of taking this class?

- *“That I need to [take] into account other peoples thoughts and feelings more.”* TURF
- *“I take working in groups [to be] more intriguing and helpful. I get to see how others think.”* HORT

What one practice/behavior has changed or altered for you as a result of taking this class?

- *“The ability to think from more than one perspective.”* AG MECH
- *“I am a better critical thinker because of my ability to listen and fair mindedness I learned from this class.”* AG EDUCATION

Exit survey student responses

What one practice/behavior has changed or altered for you as a result of taking this class?

- *“Working in interdisciplinary groups is a relatively new concept for me. Throughout this class my openness to other viewpoints has changed during the duration of this class.”*

ARCHITECTURE

- *“Working in groups and being fair minded with everybody.”* HORT

Exit survey student responses

What one practice/behavior has changed or altered for you as a result of taking this class?

- *“The ability to collaborate with multiple disciplines.”* ARCHITECTURE
- *“Group work”* MARKETING/MGT
- *“I will listen to everyone’s opinions with a more open mind.”* AG EDUCATION

Ellen Vincent, Ph.D.

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Environmental Landscape Specialist

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CAFLS Excellence in Teaching 2015

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<http://www.clemson.edu/cafls/demo/>



Photo by Craig Mehaffey