

# Understanding Qualitative Research

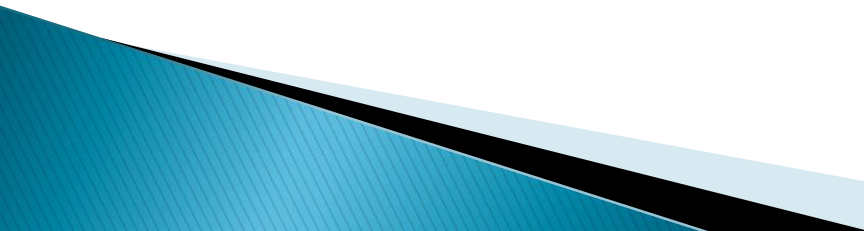
Elliot P. Douglas, University of Florida  
Ruth A. Streveler, Purdue University

# Workshop Facilitators

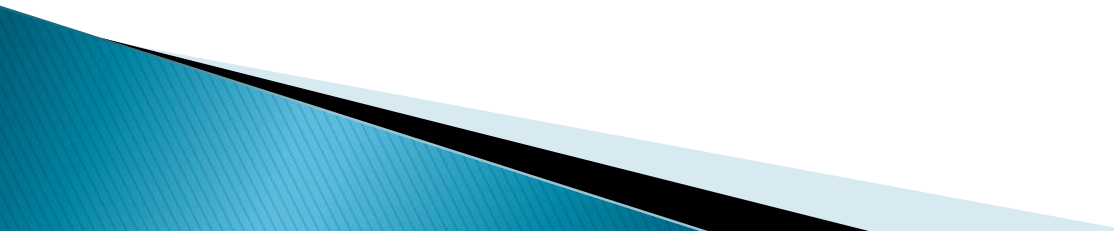
## ▶ Elliot Douglas

- Associate Chair and Associate Professor, Department of Materials Science and Engineering, University of Florida
- UF Distinguished Teaching Scholar
- Research on qualitative methodology, active learning, engineering problem-solving

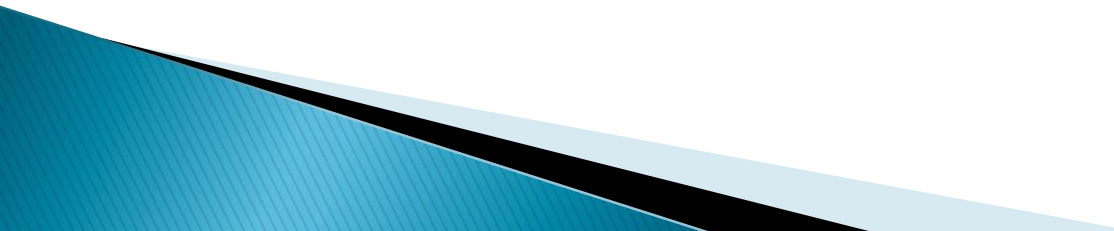
## ▶ Ruth Streveler

- Assistant Professor, School of Engineering Education, Purdue University
  - PI of RREE2, CLEERHUB
  - Research on misconceptions, developing community of engineering education researchers
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# Workshop Agenda

- ▶ *Pre-workshop evaluation questions*
  - ▶ What is qualitative research?
  - ▶ Alternate epistemologies.
  - ▶ Research design and research questions.
  - ▶ Qualitative methodologies.
  - ▶ Qualitative texts.
  - ▶ Next steps: How to use your handbook
  - ▶ *Post-workshop evaluation questions*
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# Workshop Learning Objectives

- ▶ Participants will be able to compare and contrast qualitative and quantitative research paradigms.
  - ▶ Participants will be able to compare epistemological perspectives in qualitative research.
  - ▶ Participants will be able to describe methodologies in qualitative research.
  - ▶ Participants will know what they don't know.
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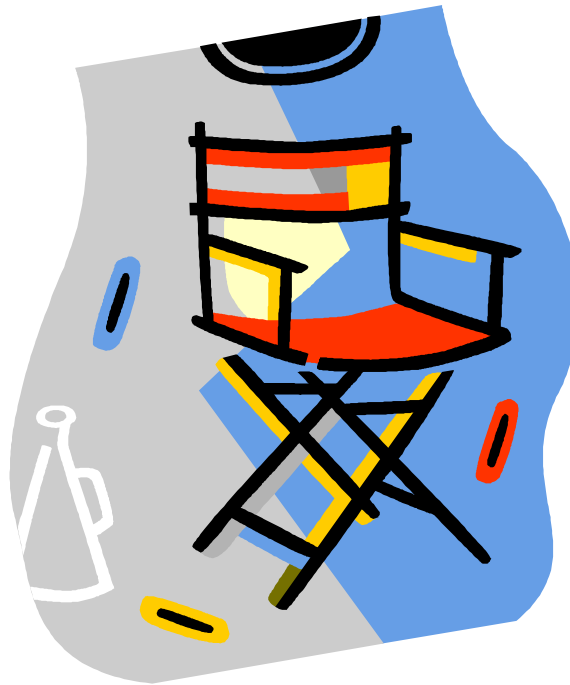
# Quantitative and Qualitative Data

	control group	treatment group.
course average	79	81
MCI pre-test*	12.15	13.55
MCI post-test	13.37	13.83
MCI gain*	1.26	0.08

Carol stated that “sometimes, we would get stuck and we would end up just sitting there because we had no idea and we would just have to wait for him (the instructor) to come around or to say, or we’d ask other groups but we would try and look up the answers in the book.”

According to Jason, “it [the worksheets] helped us figure out the material without having to hear it from someone... he [the instructor] directed us towards the answer and then we could figure it out on our own.”

What kind of information do you get from each type of data? What kinds of research questions does each answer?



# Types of Educational Research

~~Quantitative~~

~~Qualitative~~

# Types of Educational Research

## Post-Positivist

Single reality.

Relationships among  
variables.

Methods and variables  
defined in advance.

Researcher is  
detached.

Context-free  
generalizations.

## Interpretivist

Multiple realities.

Description of situation.

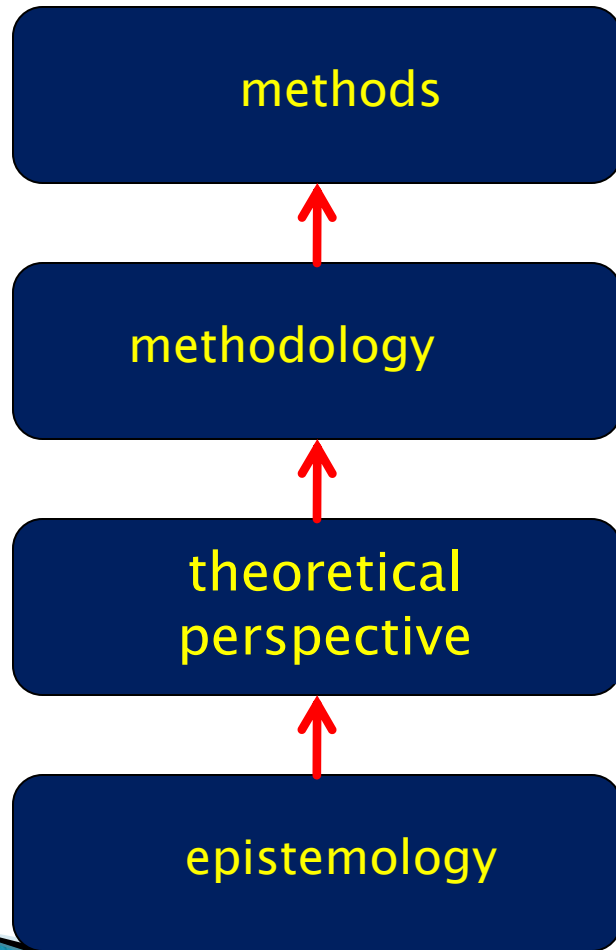
Methods and themes emerge  
during study.

Researcher and participants are  
partners.

Context-bound  
descriptions.



# Research Design



Specific procedures and techniques.

General research approach or strategy.

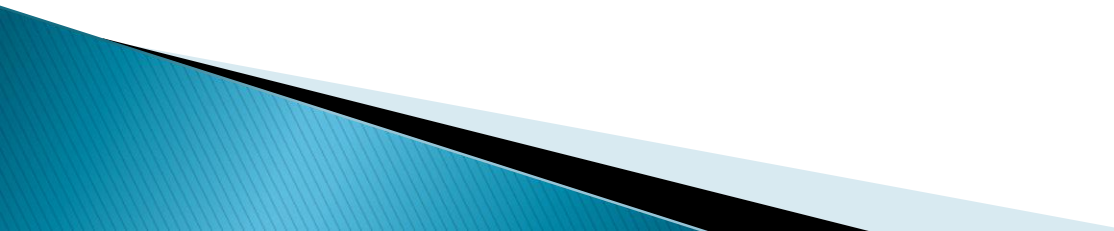
Philosophical assumptions of the methodology.

How we know what we know.

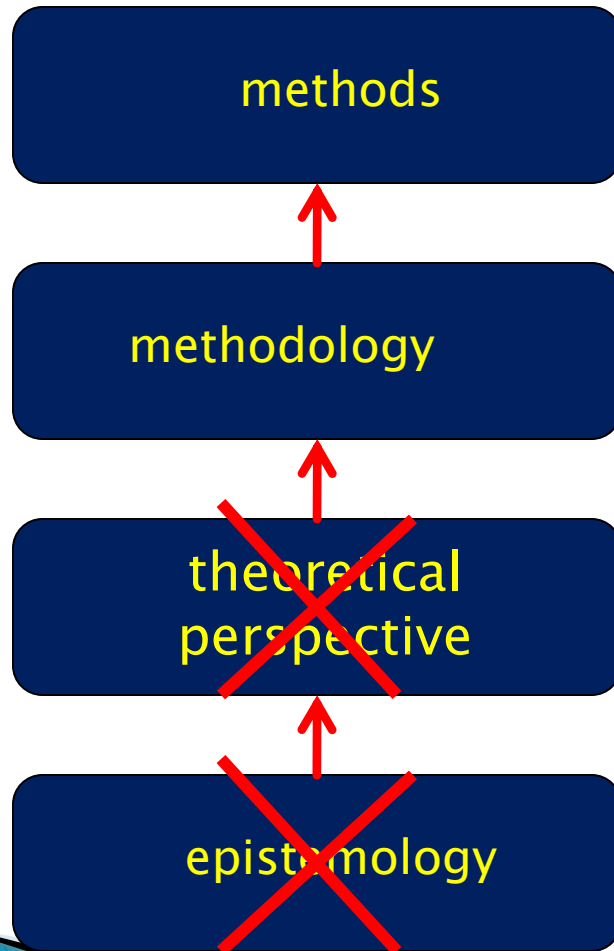
# Epistemologies

- ▶ Objectivism: Meaning is present apart from the presence of consciousness.
- ▶ Constructionism: Meaning is created through our interactions with the world and is created through an interplay between the subject and the object.
- ▶ Subjectivism: Meaning is imposed on the world by our consciousness and is created from some source other than the object (beliefs, dreams, etc.).

# Theoretical Perspectives

- ▶ Post-positivism: There is an objective world to be discovered, although there are some limitations on our ability to discover it.
  - ▶ Constructivism: Meaning is created in the mind of the individual.
  - ▶ Social constructionism: Meaning is created through social interactions.
  - ▶ Phenomenology: An experience has a singular essence to it; how our consciousness perceives that experience is also important.
  - ▶ Ethnography: Culture is the primary influence on behavior and interaction.
  - ▶ Critical inquiry: Power relations are the dominant influence on behavior and interactions.
  - ▶ Others...
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# Quantitative Research Design



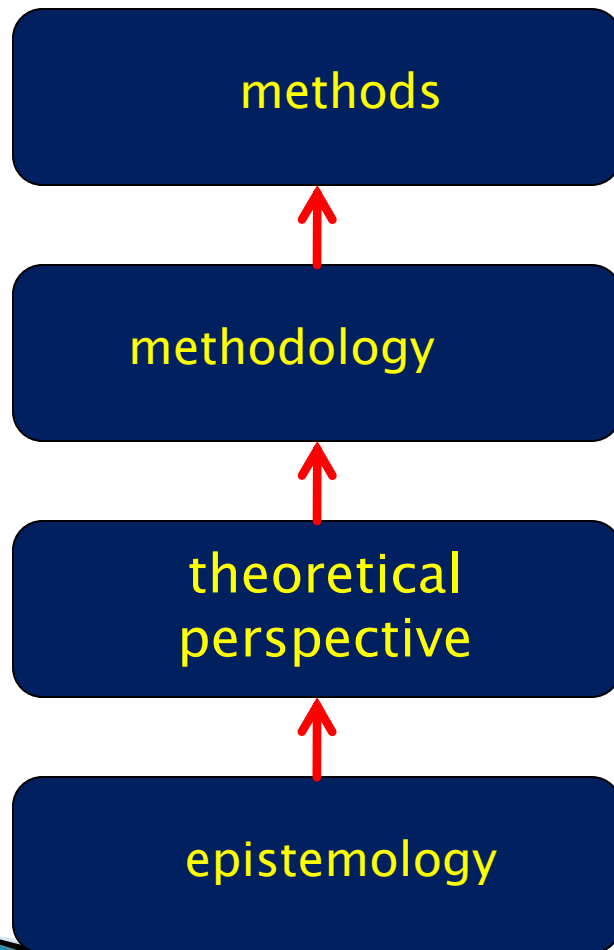
sampling, t-test, regression, HLM, etc.

Control group design.  
Quasi-experimental.  
Pre-/post-test design.  
Etc.

Positivism  
Post-Positivism

Objectivism

# Qualitative Research Design



Interviews, focus groups, document analysis, discourse analysis, narrative analysis, grounded theory analysis, phenomenological analysis, etc.

grounded theory, action research, ethnography, case study phenomenology, etc.

constructivism, social constructionism, phenomenology, hermeneutics, ethnography, critical inquiry, feminist inquiry, post-structuralism, etc.

Constructionism  
Subjectivism

# Example Research Design

How do engineering students construct knowledge in a guided inquiry classroom?

Epistemology: Constructionism

Knowledge is constructed through our interactions with the world.

Theoretical Perspective: Constructivism

Knowledge is constructed by individuals.

Methodology: Grounded Theory Approach

Result is a description of relationships among concepts (theory) uncovered in the data (grounded).

Methods:

Blog entries, observations, individual interviews, coding (open→focused→theoretical).

# Example Research Design

## (courtesy of Lisa Benson, Clemson University)

Epistemology: Objectivism

Knowledge exists in the world for us to discover.

Theoretical Perspective: Post-positivism

There is a single, falsifiable reality which we seek to uncover.

Methodology:

Protocol analysis of problem-solving transcripts.

Methods:

Coding of transcripts, determination of inter-rater reliability,...

Donath, L., R. Spray, N. S. Thompson, E. M. Alford, N. Craig, and M. A. Matthews. 2005. Characterizing discourse among undergraduate researchers in an inquiry-based community of practice. *Journal of Engineering Education* 94:403-17

“Vygotskian approaches to education see learning as **fundamentally social**, taking place through human interaction.”

“In this setting, **discourse analysis** is used to characterize active learning as **a set of communicative processes** wherein group members with different expertise and perspectives are valuable to one another’s learning.”

“This **pattern of interaction** [discursive activities identified in the data analysis] **illustrates the social orientation** of learning envisioned by Lev Vygotsky, in which learners build on their existing knowledge through group interaction. “



# Research Questions

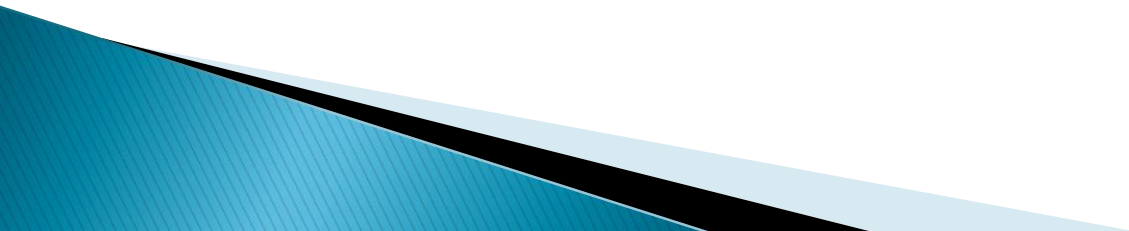
- ▶ A good research question:
  - is clearly aligned with a particular epistemology and theoretical perspective.
  - is carefully written – every word counts!

Who or what are the primary influences and sources of information used by first generation college students in choosing engineering as a college major, and how do these differ from continuing generation college students?

How do first generation college students experience social capital as they make decisions to enter and persist in engineering?

# Does active learning work?

A good starting point, but not a research question.



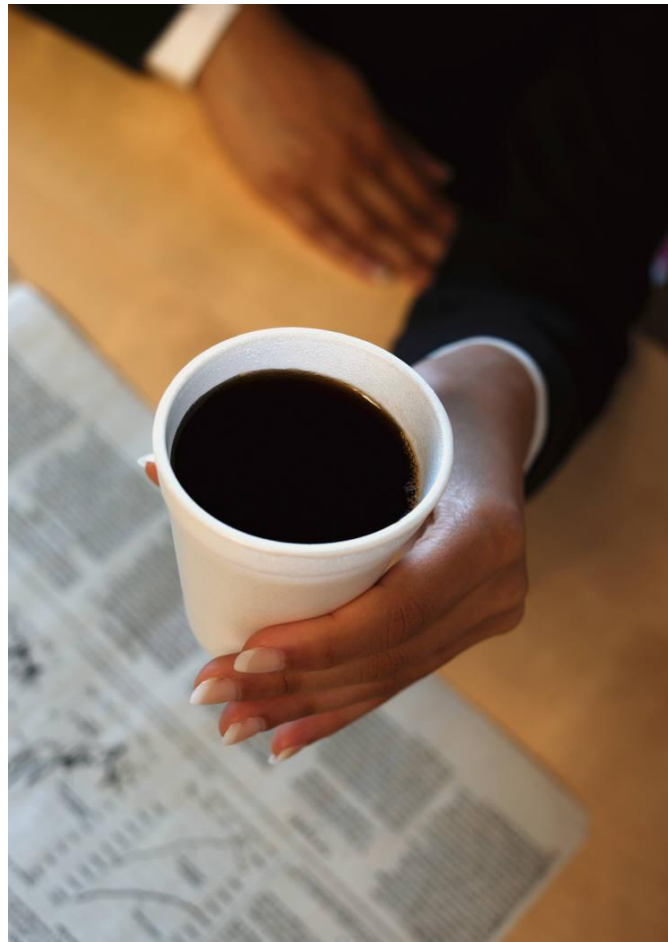


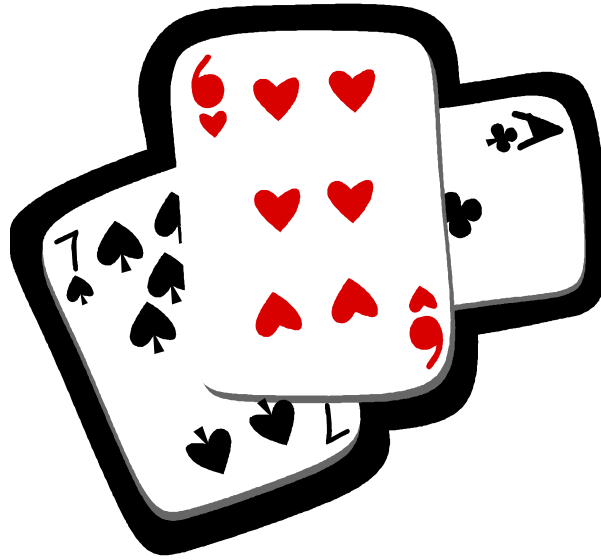


Individually write down your idea for a qualitative research project. Then turn it into a research question. Try to align the research questions with a particular theoretical perspective that matches how you would eventually want to present the findings.

Share your research questions at your table. Discuss the following:

- What theoretical perspective does it appear to be aligned with?
- Is this the perspective that was intended?
- What kinds of data collection and analysis methods do you think you would use to answer this question?





# Data Analysis

Coding is not  
analysis.



# What is Coding?

- ▶ Data organization
  - Sorting your data so it is easier to analyze
  - Applying short labels to your data so it is easier to analyze
- ▶ Analysis begins **after** coding



# Qualitative Methodologies

- ▶ Thematic analysis: Organize codes into themes.
- ▶ Grounded theory: Organize codes into successively higher levels to create a theory.
  - If you don't create a theory, it is not a grounded theory study.
- ▶ Phenomenology: Description of an experience.
- ▶ Discourse analysis: Examination of how texts are constructed.
- ▶ Narrative analysis: Creation of a story from the data.
- ▶ Ethnography: Become a participant-observer for an extended period of time.
- ▶ Others...

# Analysis of “*Five traditions*”, Creswell

method	Biography Phenomenology Grounded theory
methodology	(Biography) (Phenomenology) (Grounded Theory) Ethnography Case Study
theoretical perspective	(Phenomenology) (Ethnography)
epistemology	



# Suggested Readings

- ▶ Michael Crotty (2003) The foundations of social research, Sage Publications, Thousand Oaks, CA
  - Overview of epistemologies and theoretical perspectives.
- ▶ Carol Grbich (2007) Qualitative data analysis: An introduction, Sage Publications, Thousand Oaks, CA
  - Overview of some analysis techniques
- ▶ Clark Moustakas (1994) Phenomenological research methods, Sage Publications, Thousand Oaks, CA
  - Theoretical and methodological aspects of phenomenology.
- ▶ James P. Gee (2005) An introduction to discourse analysis: Theory and method, Routledge, New York
  - Theoretical and methodological aspects of discourse analysis.

# Suggested Readings

- ▶ Juliet Corbin and Anselm Strauss (2007) Basics of qualitative research: Techniques and procedures for developing grounded theory, Sage Publications, Thousand Oaks, CA
  - Most recent description of “classic” grounded theory.
- ▶ Kathy Charmaz (2006) Constructing grounded theory, Sage Publications, Thousand Oaks, CA
  - Constructivist grounded theory.
- ▶ Anthony Bryant and Kathy Charmaz, eds. (2007) The SAGE handbook of grounded theory, Sage Publications, Thousand Oaks, CA
  - Writings on various aspects of grounded theory

# Acknowledgment

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