

# Gathering SoTL Evidence: Methods for Systematic Inquiry into Student Learning

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## Gathering Evidence

Prior Knowledge Probe:

- Do you have a SoTL research question 'ready to go'?
- Have you ever completed an IRB protocol?
- Have you ever:
  - Written and/or administered a survey/questionnaire
  - Conducted a research interview
  - Facilitated a focus group
  - Conducted a Protocol Analysis
  - Used student assignments as evidence for a SoTL RQ
- On a scale of 1-10 (1 = novice; 10 = experienced) where would you place yourself in terms of knowing 'how to'
  - Write a learning-centered SoTL research question/
  - Gather evidence to answer that question?

## Overview

- Getting Ready
  - Orientations to SoTL research
  - Developing Good SoTL Research Questions
  - IRB Protocol
- Constructing Questions: Insuring Good Evidence
- Developing Measures: Common Formats
  - Class Assignments and Inventories
  - Focus Groups/Interviews
  - Protocol Analysis/Think Alouds
  - Observation

Good research is not about good  
**Methods** as much as it is about  
good **Thinking** (Stake, 1995)

## Getting Ready: Orientations to SoTL Research

## Orientations to SoTL Research

- Interpretive Orientation
- Quasi-Objective Orientation
  - What are research goals of each?
  - How is human behavior viewed?
  - What types of methods typically characterize each orientation?
  - What are strengths/difficulties of each orientation?
  - Where do you stand? Is there a disciplinary stance?

	Quasi-Objective	Interpretive
What is the goal of doing research?		
What motivates human behavior? Why do students act as they do?		
What types of methods are most appropriate		
Strengths/Difficulties		

	Quasi-Objective	Interpretive
Research Goals	Explain and predict	Understand and interpret meaning
Motivation for Human Behavior	Natural forces shape behavior	Humans have conscious choice
Types of Methods	Often Quantitative -Surveys, content analysis, experimental design	Often Qualitative -Interviews, Focus Groups, Observation, Discourse Analysis
Strengths/Difficulties	Useful/practical  Detached; overly objective	New insight  Fewer opportunities to generalize

## Orientations to SoTL Research

- Awareness of your own orientation preference shapes your SoTL question and your method for gathering evidence
  - What kinds of questions you ask
  - What kinds of methods you choose

## Reflection

- Given your SoTL research question (or teaching/learning questions), which orientation do you think might work best? Or would you favor both? Why?

## Getting Ready: Determining Your Learning Goal

## Developing Learning Goal (LG)

- Focus first on your learning goal. What do you most want your students to learn?
- Learning Goals Inventory

## LG Goal Development

- **Who:** (instructor . . . YOU)
- **Seeks to:** help students learn how to think more creatively about culture and identity
- **Which students:** my Cultural America students
- **When:** Fall semester 2011
- **Where:** in class and outside class
- **How:** through creation of a digital video connected to a service learning project
- **Why:** because creative thinking is essential to understanding own identity, culture, and diversity
- **LG:** I intend to help students learn how to think more creatively in my Fall 2011 Cultural America class by asking students to produce a digital video connected to a service learning project

## Defining/Describing LG: Creative Thinking

- How would you define 'creative thinking'?
  - What would it look like? What are its characteristics?
  - How would you describe it?

## Example LG: Creative Thinking

- **Define:** capacity to combine or synthesize existing ideas, images, or expertise in original ways, and the experience of thinking, reacting, and working in an imaginative way characterized by a high degree of innovation, divergent thinking, and risk taking.

## Example LG: Creative Thinking

- **Describe:**
  - Taking risks
  - Solving problems
  - Embracing contradictions
  - Thinking innovatively; divergently
  - Connecting, synthesizing, transforming
  - Combining disparate ideas in original ways

Additional Descriptive  
Characteristics  
for Possible Learning Goals

[www.aacu.org/value/rubrics](http://www.aacu.org/value/rubrics)

Define and Describe Your Learning  
Goal on Project Worksheet

## Getting Ready: State Your SoTL Research Question

## State Your SoTL Research Question

- 'What is' the current state? You may just want to know how students understand "x" or how they do "x" or . . .
  - Descriptive
- What works? What happens if I intervene? Often includes your teaching intervention(s)/tool(s) that help the students to learn
  - How does this type of lecture help students learn . . .
  - How does this activity help students learn . . .
  - Exercise
  - Assignment

## Example

- LG: Develop students as creative thinkers

Write two "What is" questions and two "What works" questions for this learning goal

Share with colleagues

## Questions

- SoTL Research Question(s):
  - How do students understand creative thinking? (What is?)
  - What do students do when they think creatively (What is?)
  - Does having students work with visual formats lead to better creative thinking? (What works?)
  - Does teaching creative thinking formats help students learn to be better creative thinkers? (What works?)

## Your SoTL question

- Based on your learning goal (stated on your document), write at least one 'what is' and one 'what works' question
- Share with colleagues for their feedback

Write your SoTL Research Question on Your Planning Document

## Getting Ready: Human Participants' Consent

### IRB Knowledge Probe

Whitepaper on SoTL and IRB  
UWS SoTL website:  
<http://sotl.uwm.edu>

## Constructing Questions: Insuring Good Evidence

## Asking Good Questions

- If SoTL is focused on student learning then we will want to gather SoTL evidence by asking our students **questions** about their learning.
- Asking questions of our students helps us figure out whether our students are learning what we think we are teaching

## Writing Good Questions

- Take a look at the questions on these pre-knowledge inventories and critically examine/compare them.
  - What do you notice?
  - What do you like/not like?
  - What would you change?

## The Impact of Questions on the Research Process

- Poor questions lead to lousy results
- How might answers to these questions differ?
  - Do you attend class?
  - Do you **regularly** attend class?
  - How many times per week do you attend class?
- Asking good questions is part science and part art

## Types of Questions

- Open Ended and Closed Ended Question Formats
- Attitude, Knowledge, and Behavior Question Formats

## Open and Closed Ended Questions

- What are advantages and disadvantages to open- and close-ended questions?

## Advantages and Disadvantages

### Open Ended Questions:

- May provide more complete answers
- May provide information researchers did not anticipate
- Are often more time consuming to answer
- Responses are often harder to analyze
- May produce lesser response rate

## Attitudes/Feelings, Knowledge, Behaviors

- SoTL researchers are interested in asking questions about:
  - how students FEEL or THINK about certain issues, topics, activities, related to their learning,
  - what students KNOW about various topics, etc.
  - how often students engage in certain learning BEHAVIORS

## Attitude, Knowledge, and Behavior Questions

- Can you find an attitude/feelings, knowledge, and behavior question on the inventories?

## Your LG

- Jot down one attitude/feelings question, one knowledge question, and one behavior question for your SoTL research.
- Make one of these questions open-ended; one closed-ended.
- Share with colleagues for their feedback

## Constructing Questions: Issues and Problems

## Recall Questions

- Question one on Group Work Inventory asks students to “recall” some behavior
  - Would you know how to answer this?
  - Is there a better way to ask this question?

## Using Diaries for Recall Questions

- To minimize recall errors, researchers can ask respondents to keep personal diaries to record their learning activities over a period of time

## Unaided vs. Aided Recall Questions

- **Unaided recall:** “Please list all of the Communication classes in which you participated in learning groups last semester.” (open-ended question)
- **Aided recall:** “Please place a check by any of the Communication courses in which you participated in a learning group last semester.” (closed-ended question)
  - Public Speaking
  - Introduction to Interpersonal Communication
  - Small Group Communication

## Recall Questions and Time Frame

- Focus on a specific time frame when answering a question
  - Avoid ambiguous terms like “past year” or “next year” -- may not know if this is a calendar year (i.e., 2006, 2007, 2008) or a 12-month period.
  - Avoid time frames that are too large (for the recall question) or too far in the past.

## Intimidating or Inappropriate Questions

- Question is intimidating or inappropriate if:
  - It addresses highly personal and private behavior (drinking behavior, sexual activity, illegal drug use, etc.)
  - It addresses subjects for which the respondent believes there are socially desirable norms (communication with instructors, behavior in class, spiritual behavior, etc.)
- Examples?
- Problems?

## Intimidating Questions

- Would you use an open- or closed-ended format to ask a potentially intimidating question to gather evidence from your students?
  - Examples

### Forms for Asking Potentially Intimidating Questions About Behavior

- If you ask a closed-ended question with a set of response options, people typically do not choose the extreme options.
- Therefore, it is often better to use an open-ended question and allow the respondents to indicate how often they engage in certain behaviors, or define the terms as they perceive them.

### Forms for Asking Potentially Intimidating Questions About Behavior

- Third person questions ask respondents to report on the behavior and activities of other people.
  - Example: Instead of asking college students directly about their alcohol consumption behavior and its impact on their learning, you could ask students to report how much alcohol their roommates consume and how that affects their learning behavior.

### Developing Measures To Assess Learning Goals

### Knowledge Probes, Inventories

### Knowledge Probes

1. What is HIV?
2. How is HIV transmitted?
3. Name some risk behaviors that may increase the chance of exposure to HIV?
4. What are some methods that can be used to protect against exposure to HIV?
5. How do you feel about routine HIV testing?

### Going back . . .

- What might be the 'learning goal' underlying this knowledge probe?
- What might be the research question guiding this knowledge probe?

## 2. Misconceptions/Pre-conception Test - Example

- Water vapor is one of several gases which absorb longwave radiation. Please consider two clear, calm nights. On both nights the temperature at sunset is 55°F. On the first night there is a moderate amount of water vapor in the atmosphere, and the temperature drops throughout the night to a minimum of 45°F. On the second night the level of water vapor in the atmosphere is quite low.
- 2. What minimum temperature would you expect on the second night?
  - a. I'm certain that the minimum temperature will be several degrees colder than 45 degrees F, and I can explain why.
  - b. I suspect that the minimum temperature will be several degrees colder than 45 degrees F, but I would have difficulty explaining why.
  - c. I really have no idea what minimum temperature to expect.
  - d. I suspect that the minimum temperature will be several degrees warmer than 45 degrees F, but I would have difficulty explaining why.
  - e. I'm certain that the minimum temperature will be several degrees warmer than 45 degrees F, and I can explain why.

-UWM Jon Kahl, Atmospheric Sciences

## Inventory

- Check out Randy Bass' knowledge probe.
  - Comments?
  - Might you use something similar to gather evidence in your study?

## Knowledge Summaries

- ## Knowledge Summaries
- Summarize the key idea in a single sentence
  - Summarize by identifying:
    - Who
    - What
    - When
    - Where
    - How
    - Why
  - Would this be a useful way for you to collect evidence for your investigation?

## Example

**Attachment B**  
Classroom Assessment  
One-Sentence Summary  
NRSG 322

Student Name: \_\_\_\_\_  
Date: \_\_\_\_\_

*Associated Outcome: Analyze the potential psychosocial problems associated with burn injury and application to nursing practice*

Patients suffering from major burn injury require immediate physical and psychological care. Psychosocial care for patients experiencing major burn injury is often overlooked or delayed during the acute phase of injury. This leads to long-term sequelae of psychosocial distress.

Working as quickly as you can, your task is to summarize the information provided to you from Joan's story and the burn presentation in just one sentence. You are to focus on the psychosocial aspects of burn care. The "Who" of the exercise are nurses. Use the questions below as a guide for your sentence. Write your one-sentence at the bottom of the page as instructed.

**WHAT?** Nurses

**DOES WHAT?** assess and evaluate

To What or **WHOM?** burn injured patients

**WHEN?** immediately upon arrival to the hospital

**WHERE?** in the ED, critical care, general ward, and rehabilitation units

**HOW?** through therapeutic communication with patients and families

**WHY?** to prevent unnecessary anxiety, psychological pain and suffering and facilitate the natural process of psychological healing.

In sentence form: Nurses assess and evaluate burn injured patients immediately upon arrival to the hospital in the ED, critical care, general ward, and rehabilitation units through therapeutic communication with patients and families to prevent unnecessary anxiety, psychological pain and suffering and facilitate the natural process of psychological healing.

## Application

## Application and Performance

- Ask about concepts, theories:
  - How could I use this in real life?
  - Give two examples of how you would apply . . .
  - Use case study and ask them to apply it to life

## Analysis

Example

COMSDIS 704 Speech Fluency and Stuttering (Seery)

Name \_\_\_\_\_ Date \_\_\_\_\_

Stuttering and Fluency Differential Diagnosis Pre-Post- Instruction Exercise

Based on the description of case \_\_\_\_\_, please answer the following:

1. Based on Gutter's classification criteria, which stage or progression of stuttering is indicated: (circle) Borderline Beginning Intermediate Advanced

2. Please provide the points of evidence from the case description, and explain your answer to #1.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Is there other information you have wanted to know in order to answer #1? (circle) Yes No

4. If you answered "Yes" to 3, describe the information you would have wanted to know:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## Pro/Con Grid: Death Penalty

Viewpoint: Stakeholders	Pro: Advantages Benefits	Con: Disadvantages Costs
Criminals		
Relatives of murder victim		
Society		
Lawyers		
Families of criminal		

## Problem-Solving

### Problem Recognition Task Exercise

For each statement listed below, determine whether care activities for that patient can be safely delegated to either a licensed practical nurse or unlicensed assistive personnel. Use the information regarding supervision and direction of delegated nursing acts from the Wisconsin Nurse Practice Act and the Patient Care technician job description for General Hospital in your decision making process.

Yes	No	Situation
		An 11 year old female diabetic patient with a blood sugar of 800 and severe dehydration
		A 67 year old female patient with a gastrointestinal tube feeding with a diagnosis of congestive heart failure and debilitating arthritis
		A 36 year old female patient, 2 days post appendectomy that needs to be ambulated.
		A new colostomy patient who requires fitting of the appliance and the first irrigation procedure.
		A 78 year old female patient, 4 days post-op for hip replacement requiring a sterile dressing change.
		A patient with a right-sided cerebral vascular accident who requires assistance with tube feeding
		A 33 year old female, 3 days after an open-reduction and internal fixation of the right leg who needs the catheter discontinued today
		A 21 year old patient, 2 days post-op from an appendectomy who has a fever of 99.6 and needs to be ambulated today.



## Other Forms of Measurement or Assessment

## General Formats for Measurement

- In-class writing or exercises
- Journals/Reflections
- Papers
- Audiotapes
- Videotapes/Film
- Digital formats (storytelling)
- Other types of products?

Identify A Measurement Tool(s) on your Planning Document

More Evidence Gathering Formats

## Focus Groups

## Nuts and Bolts of Focus Groups

- Describe what they are; what they look like
- What are preparation requirements?
- What does a focus group session look like?
- What are the benefits/drawbacks to focus groups for gathering evidence?

## Focus Groups

- Focus groups involve free-flowing discussion among an invited group of individuals (usually 6-12 people) regarding a broadly defined topical area.
- Focus groups are led by a **trained** moderator who is responsible for guiding the flow of the discussion.

## Preparation for Focus Groups

- Recruit participants
- Determine size (4-12) and time allotment
- Decide the focus
- Read the relevant literature
- Formulate questions—high or low moderation
- Identify prompts and probes

## Ordering of Questions

- Start with easy, salient, broad, and non-threatening questions first
  - Follow up with more specific questions, probes, and prompts
- Complete questions on a single topic before moving on to a new topic.
- When switching topics, use transitional phrases to make it easier for respondents to switch their train of thought.

## Sample Focus Group on Student Plagiarism

- What are your study habits?
  - Can you tell me about your study habits in high school?
  - How did that prepare you for college?
    - Are your current study habits good? Why or why not?
    - If not, what should you change? Why?
- Describe how you typically complete homework assignments.
  - Have you ever been given an assignment that was really stressful or difficult? How did you tackle that?
- What do you think about student collaboration on assignments?
- What do you think about student cheating?
  - How do you think a university or instructor can discourage students from copying others' work?

## Probes

- That's very interesting. Can you tell me more?
- That must have been difficult. Can you tell me more?
- What happened after that?
- Do you have an example of when that happened?
- Could you clarify? Perhaps with an example?
- What does "x" mean?

## Conducting Focus Group Discussion

- Tolerate silence
- Observe non-verbal communication
- Be careful of moderator bias
- Encourage talk
- Monitor group communication dynamics
- Establish ground rules
- Summarize key points at end

## Practicing Focus Groups

- Develop a set of focus group questions to gather evidence from a set of faculty addressing one of these foci:
  - Millennial Students and Learning
  - Threshold Concepts: Concepts in your subject/discipline which are crucial to mastery and which many students find difficult to learn
  - Teaching Difficulties and Concerns

## Focus Groups

- What are advantages/disadvantages to focus groups for gathering evidence?
- Would focus groups be a good way to collect evidence for your SoTL project?
  - If so, who would you include?
  - What kinds of questions might you ask?

## Advantages and disadvantages of focus groups

- Advantages:
  - Can be a rich source of information with potential “a-ha” moments.
  - Can be very helpful in the early stages of qualitative research to set the stage for later quantitative research.
  - Very good for feedback on new ideas.
- Disadvantages:
  - Heavily dependent on the skill of the moderator.
  - Observations and outcomes may not generalize to the broader population.
  - Fairly expensive and difficult to set up.
  - Peer influence may prevent (or overly encourage) certain communication

## Protocol Analysis

## Nuts and Bolts of PA

- What does it look like; how would you describe it?
- What preparation is needed?
- What does the process look like?
- What are the benefits/drawbacks to this method for gathering evidence?

## Performing a Protocol

- Partner with another person. Have one person “think aloud while mentally performing this task”
- Multiply 36 x 24
- **Why** would you use this method?

## Protocol Analysis

- Method for eliciting verbal reports of thought sequences
  - 'Think aloud' while performing a task
    - Multiply  $36 \times 24$

OK, 36 times 24, um, 4 times 6 is 24, 4, carry the 2, 4 times 3 is 12, 14, 144, 0, 2 times 6 is 12, 2, carry the 1, 2 times 3 is 6, 7, 720 144 plus 720, so it would be 4, 6, 864

## Protocol Analysis

- Participants are NOT asked to describe or explain how they solve the problem, but to remain focused on solving the problem and merely to give verbal expression to those thoughts that emerge in that process
- Would this work for your SoTL project?
  - If so what would you ask the student to explain or describe?

## Observational Evidence

## Nuts and Bolts of Observation

- What is this? How would you describe this method?
- What preparation is needed?
- What does the process look like?
- What are the benefits/drawbacks to using this method for gathering evidence?

## Observational Evidence

- Systematic recording of the activities of students or instructors.
- Draws heavily from ethnographic research.

## Obtrusive vs. Unobtrusive Observation

- With visible observation, students or instructors are aware that their behavior is being observed by researchers or recording devices.

## Unobtrusive Observation

- Researchers might observe students in their natural habitat (classroom) through one-way mirrors, or by sitting in the class.
- Afterwards, these researchers will typically take notes regarding their observations.

## Nonstructured vs. Structured Observation

- Nonstructured observation: When researchers don't know what to expect, they will take notes with the eventual hope of creating a systematic category coding system of behaviors.
- Structured observation: When the behavior to be observed is well defined, researchers may use a coding sheet and merely "check off" how often certain phenomena occur

## Observation

- Would this method be useful for gathering evidence for your SoTL question?
  - If so, how would you do it?

## Reflection and Application

- What is your learning goal?
- What is your SoTL research question?
- What is your instructional intervention (for what works questions)?
- What evidence gathering tools/techniques will you use?
- Share plan with colleagues (if there is time)
- Best of luck with these projects!