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# Do What You Do AND Make It Scholarly, Too!

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# Announcements

- Dr. Wardrop is finalizing mentor pairings
- Check out the AOE website for upcoming events
  - <https://www.med.unc.edu/aoe/>

# Introduction & Acknowledgements

This workshop is adapted from workshops originally presented at the Council on Medical Student Education in Pediatrics 2015 Annual Meeting.

## Experience

Who has attempted (successfully or unsuccessfully) to disseminate an educational innovation?

# Objectives

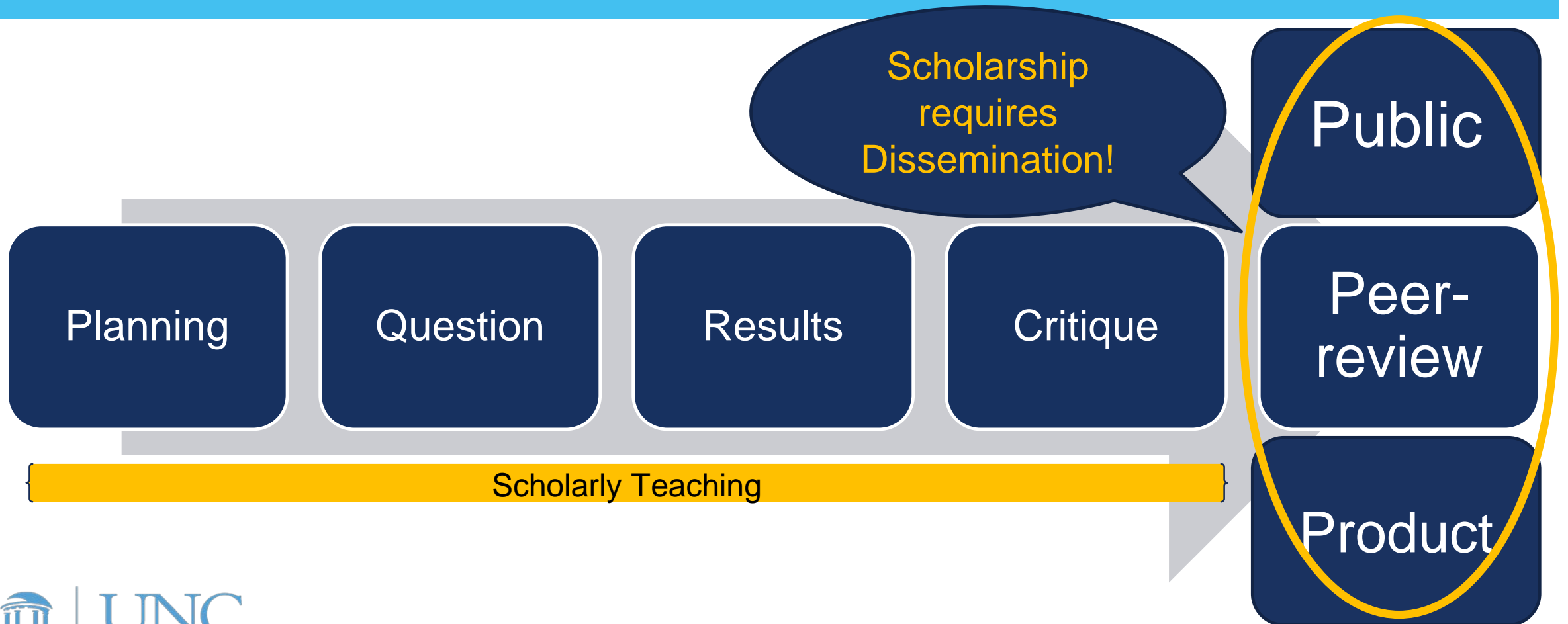
By the conclusion of this workshop, you will be able to:

1. Identify an educational innovation that could be disseminated
2. Develop a preliminary research question that relates to the innovation
3. Outline the key components to effective outcome measures
4. Design an evaluation plan for your innovation

# Focus on Outcomes

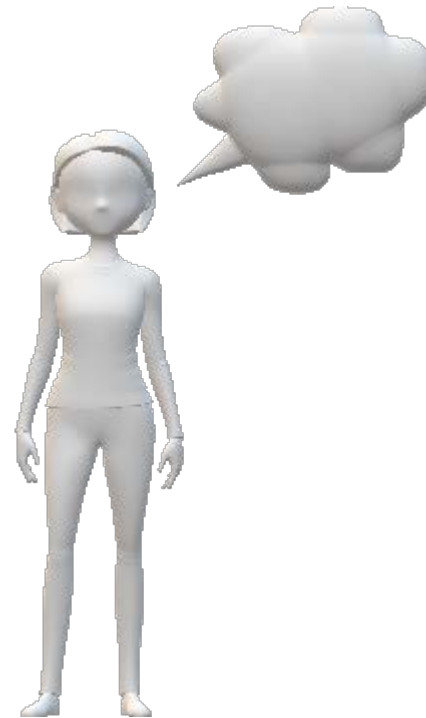
# What Is an Innovation Worth Sharing?

# What Is Meant by “Sharing”?

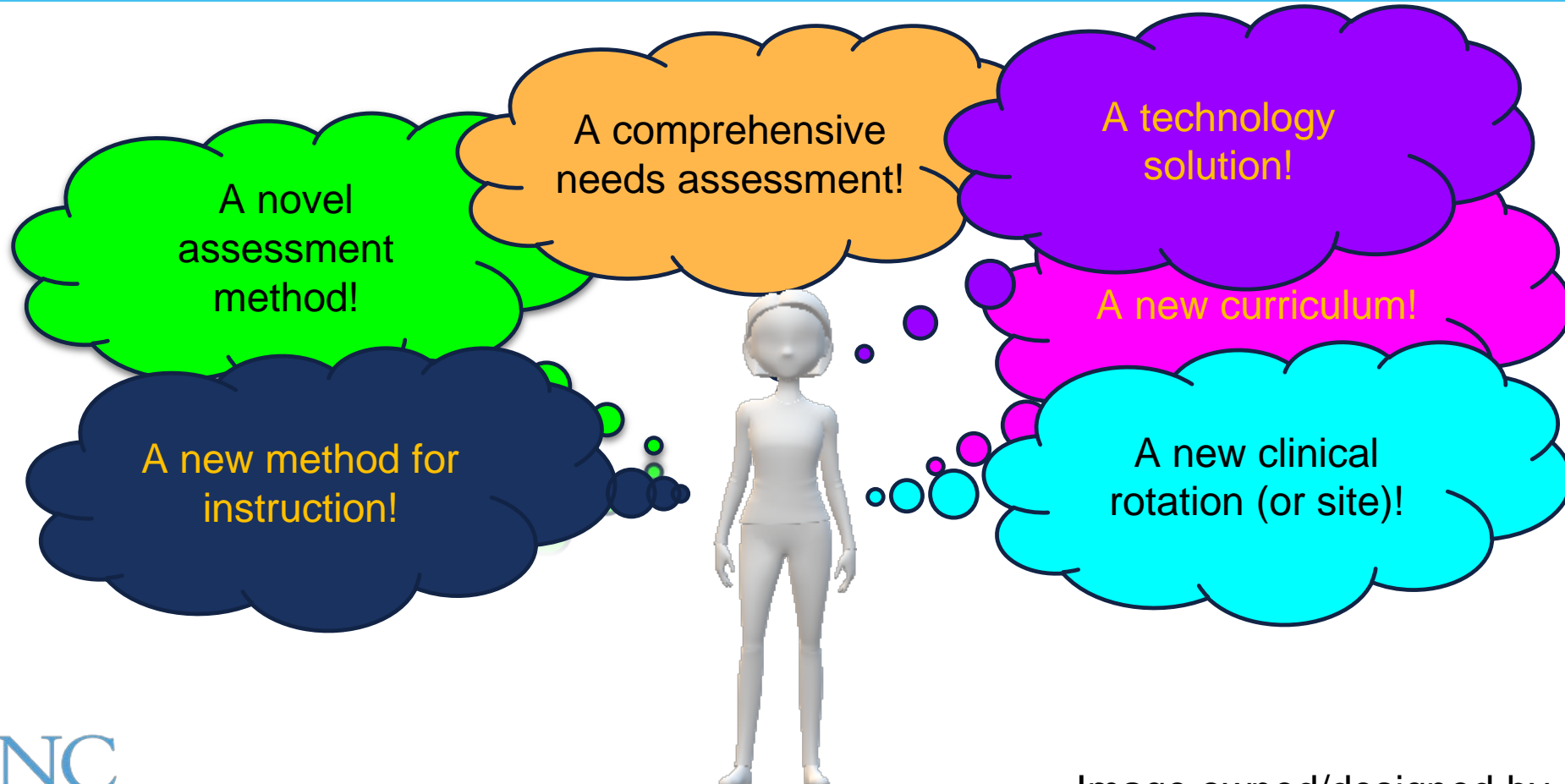




# Sharing Begins with an Innovation



# Sharing Begins with an Innovation



# How to Describe Innovations

1. What is the problem being addressed?
2. How generalizable is the issue?
3. Whom does the problem affect?
4. What potential solutions exist?
5. Why was the particular solution chosen?
6. What was the innovation?
7. Was the solution effective?
8. What impact will this innovation have?
9. Is the innovation sustainable?

# Alignment with Glassick's Criteria for Scholarship

	Clear Goals	Adequate Preparation	Appropriate Methods	Significant Results	Effective Presentation	Reflective critique
What is the problem?	X	X				
How generalizable is the issue?	X	X		X		
Whom does it affect?		X				
What are the possible solutions?		X				
Why was the solution chosen?		X	X			
What was the innovation?			X		X	
Was it effective?				X		X
What's the impact?				X		X
Is it sustainable?						X

# ACTIVITY #1

## ❖ Individually

- Take a few minutes
- Consider an activity you do or an innovation you have done or are considering implementing you may want to share

## ❖ Share within your group

## ❖ Report Back

# DISCUSSION FROM ACTIVITY #1



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# Value of the Literature Search

	Clear Goals	Adequate Preparation	Appropriate Methods	Significant Results	Effective Presentation	Reflective critique
What is the problem?	X	X				
How generalizable is the issue?	X	X		X		
Whom does it affect?		X				
What are the possible solutions?		X				
Why was the solution chosen?		X	X			
What was the innovation?			X		X	
Was it effective?				X		X
What's the impact?				X		X
Is it sustainable?						X

# Value of the Literature Search

## ***A Statement of Need...***

1. What is the problem? How big is it?
  1. For learners
  2. For educators
2. What have people done (so far) to address it?
3. What might be an ideal approach?



# The Research Question

Research is an Interactive AND Iterative Process

# The Research Question

You have an interesting idea...  
what is the right research *question*?

# Types of Educational Research Questions

- ❖ Exploratory (The “What” Questions)
  - Seeks to gain an understanding of a new topic
- ❖ Descriptive-Comparative (The “How and Who” Questions)
  - Presents a picture of a specific situation
- ❖ Explanatory (The “Why” Questions)
  - Identifies the reasons why certain things occurs

# Components of a Research Question

1. What major outcome(s) (**dependent variable**) are you interested in?
2. What intervention (**independent variable**) are you interested in?
3. Are you looking for **differences** or a relationship (**association**)?
4. To what group (**population**) do you wish to apply your results?
5. What is your **specific** research question?
6. What answer do you expect to find to your question? (**The research hypotheses**)
7. Why is this question important today? (**Relevance**)

# Definitions

- ❖ **Variables\***: Represent **what** you intend to measure
  - **Dependent** – what you expect to change
  - **Independent** – what you expect to cause the change
- **Effects**
  - Difference vs. Association

# Sidebar about Qualitative Research Methods

- ❖ Consider a qualitative approach to...
  - Examine **reasons** for a phenomenon
  - To understand perspective in an **open-ended** manner
  - To **discover** variables that may be important for a follow-up quantitative study
- ❖ Consider a qualitative approach when...
  - You have a question and are **open** to the answer
  - **Words and images** help answer your question
  - You want a **comprehensive**, and **descriptive** foundation

Peshkin, et al. 1993

Hurley, et al. 1999

Hanson, et al. 2011

# Scientific Rigor of Qualitative Research Methods

- ❖ Recognition of philosophical frameworks
- ❖ Rigor in methodology and data collection
- ❖ Rigor in interpretation of data
  - Credibility
  - Transferability
  - Dependability
  - Confirmability

# i-SMART

**I**nteresting: to you the investigator and to others

**S**pecific: rather than general

**M**easurable: able to assess pertinent variables and outcomes

**A**chievable: within a reasonable timeframe to stakeholders

**R**elevant and not Rehashing: adds to existing knowledge

**T**imely: obtain relevant answers within a specified period



# Example: Feedback

“Does the **Feedback App** result in more written feedback for **residents**?”

**Independent variable**

**Effect (Difference)**

**Dependent variable**

**Target population**

# ACTIVITY #2: DRAFTING A QUESTION

## 1. Individually

- Take a few minutes
- Complete the worksheet items
- Using your responses to the items, draft a research question

## 2. Group Share

# DEBRIEF: IS YOUR QUESTION i-SMART?

**I**nteresting: to you the investigator and to others

**S**pecific: rather than general

**M**easurable: able to assess pertinent variables and outcomes

**A**chievable: within a reasonable timeframe to stakeholders

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# DEBRIEF: DID YOU HIT ON ALL THE COMPONENTS?

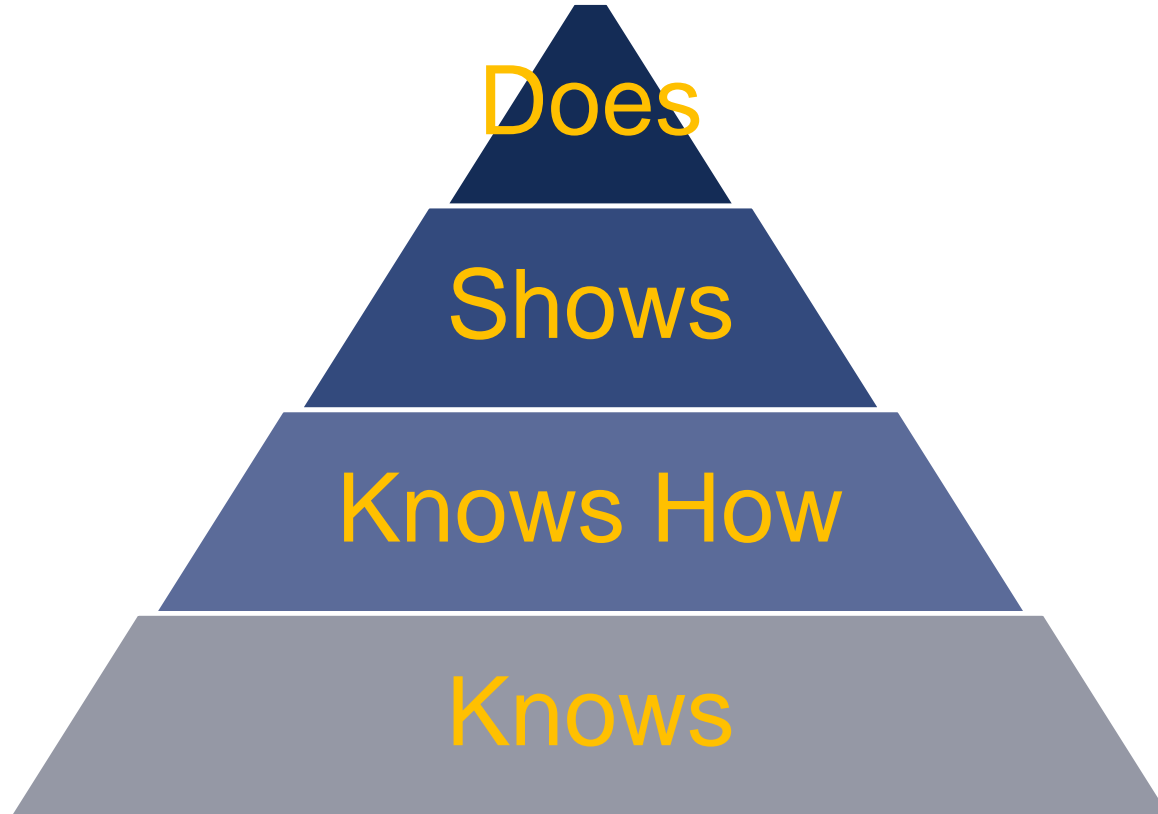
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# Linking Your Question to Outcome Measures

# Key Considerations

1. What has already been published on the topic?
2. What are you attempting to measure? Knowledge, skills, attitudes, process?
3. What resources do you have?
4. What confounders may exist? What else could influence your outcomes?

# Miller's Pyramid of Clinical Competence



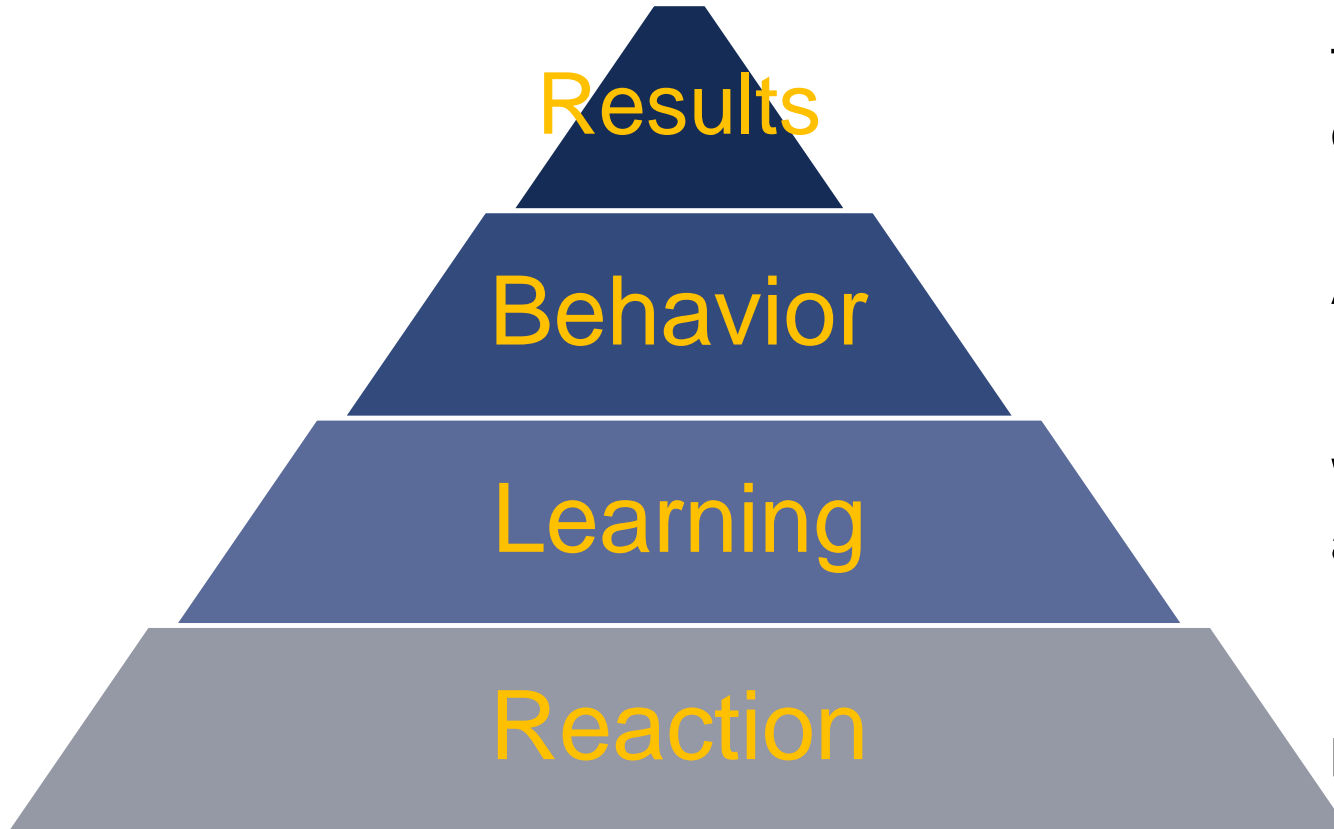
Does the learner practice the skill when functioning independently?

Does the learner perform the task when asked?

Does the learner know how to apply the knowledge? Are they competent?

Does the learner possess an appropriate knowledge base?

# Kirkpatrick's 4-level Training Evaluation Model



To what degree was the targeted outcome reached?

Are the skills being used in practice?

Were new knowledge, skills, or attitudes developed?

How was the experience perceived by the learner(s)?



# Example

Evans KH, et al. An innovative blended preclinical curriculum in clinical epidemiology and biostatistics: impact on student satisfaction and performance. *Acad Med.* 2016. 91: 696-700.

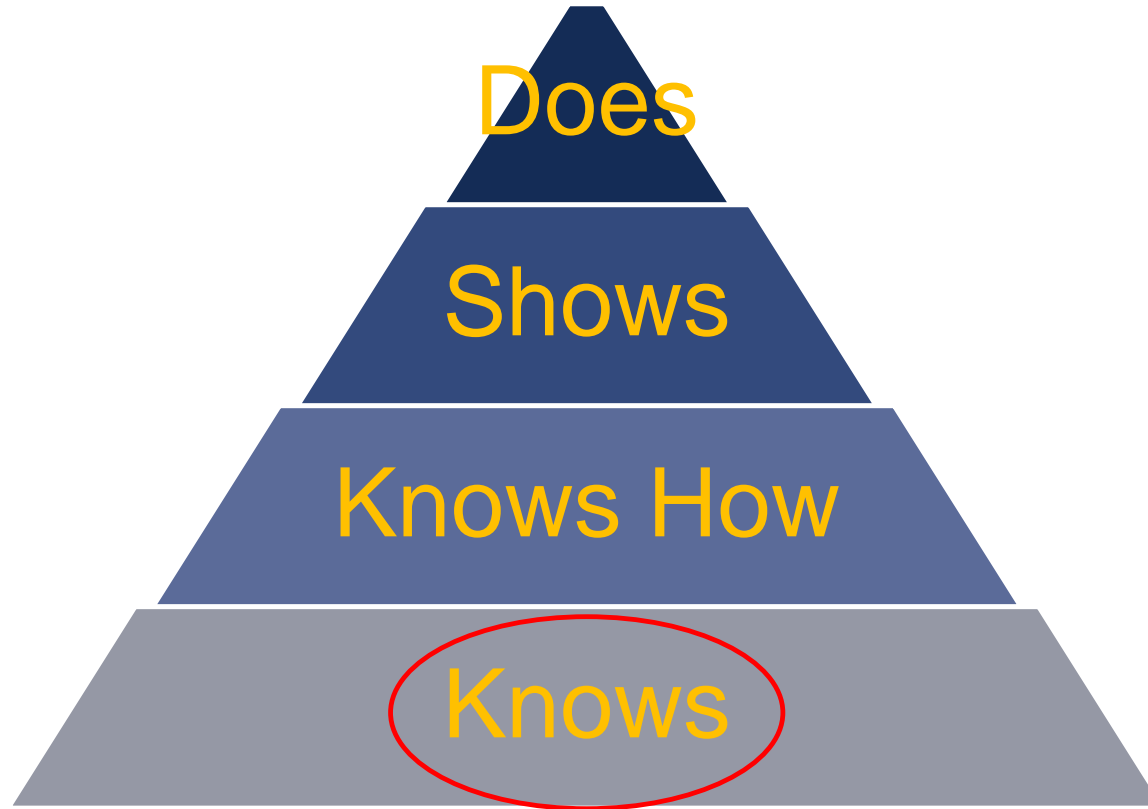
# Excerpts from the Abstract

**“PROBLEM:** There is little understanding of the impact of teaching clinical epidemiology and biostatistics in a flipped or blended format.

**APPROACH:** The blended quantitative medicine (QM) curriculum introduced in 2013 integrated self-paced, online learning with small-group collaborative learning. The authors analyzed the blended format's impact on student satisfaction and performance, comparing the pilot cohort of students (n = 101) with students who took the traditional curriculum in 2011 and 2012 (n = 178).

**OUTCOMES:** **The blended curriculum had a positive impact on satisfaction and mastery of core material.** Comparing the 2013 blended cohort with the 2011-2012 traditional cohort, there were significant improvements in student satisfaction ratings. Performance on the QM final exam showed no significant changes in 2013 versus 2011 and 2012. The majority of students in 2013 reported using the QM online videos as their primary learning resource (69%-85% across modules).”

# Miller's Pyramid of Clinical Competence



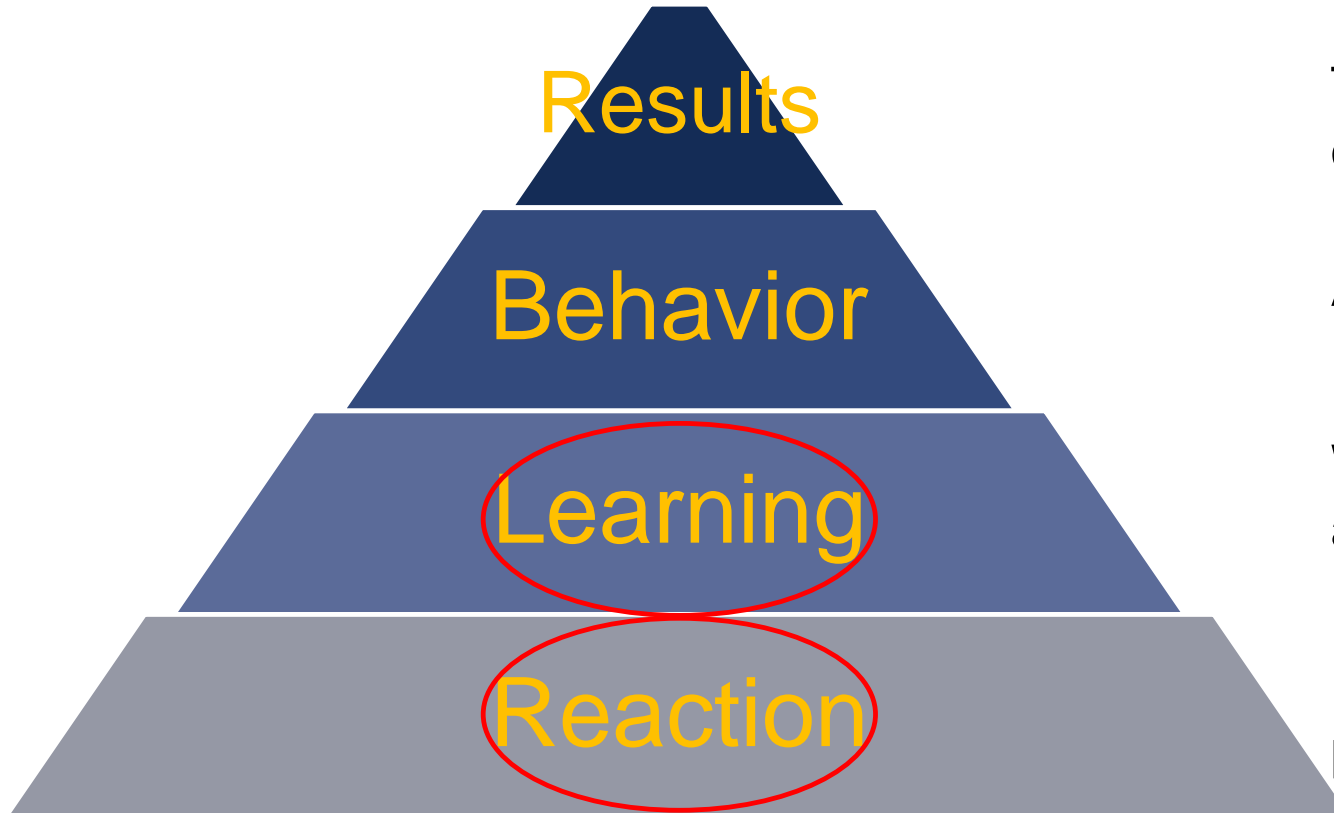
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# Kirkpatrick's 4-level Training Evaluation Model



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# Various Educational Outcome Measures

Global Rating Scale	Survey/questionnaire
Self-assessment	One-on-one Interviews
Reflective essay	Focus group discussion
Written examination	Direct observation
Oral examination	Performance audit

# ACTIVITY #3: OUTCOME MEASURES

- ❖ Group work
  - Take 10 minutes
  - Review the tools at your table to determine:
    - What is the measure? (Global rating, direct observation, etc)?
    - What is it a measure of? Knowledge, skills, attitudes, process?
    - What are its strengths? What are its weaknesses?
    - What level of outcome can it assess (using Miller's and Kirkpatrick's models)
- ❖ Large group report back

# Evaluation Plan

- ❖ Brief description of your innovation
  - What is it a measure of? Knowledge, skills, attitudes, process?
  - What are its strengths? What are its weaknesses?
  - What level of outcome can it assess (using Miller's and Kirkpatrick's models)?
  - How can you evaluate it? Is there a tool you can use?

## What Resources Are Out There?

- ❖ Don't reinvent the wheel
- ❖ Search for evaluation tools or assessments that could be modified for your innovation
- ❖ Use your librarians!



# Where to Publish?

[https://www.aamc.org/download/184694/data/annotated\\_bibliography\\_of\\_journals.pdf](https://www.aamc.org/download/184694/data/annotated_bibliography_of_journals.pdf)

<http://jane.biosemantics.org/>

<https://www.mededportal.org>

# Take Home Points

1. Dissemination allows educators to transform scholarly ideas into scholarship
2. Innovations worth disseminating range from the development of a technology solution to a complete revamp of a curriculum
3. The literature search is vital in focusing the research question and selecting an outcome measure
4. Research questions should align with outcomes
5. Miller and Kirkpatrick's pyramids illustrate the hierarchy of outcome measures in educational work
6. Each outcome measure comes with strengths and weaknesses, both of which must be considered to promote alignment between innovation, question, and evaluation.

# References

- Abramson EL, Paul CR, Petershack J, et al. Conducting quantitative medical education research: from design to dissemination. *Acad Pediatr*. 2018; 18: 129-139.
- Bordage G, Dawson B. Experimental study design and grant writing in eight steps and 28 questions. *Med Educ*. 2003; 37: 376-85.
- Chen FM, Bauchner H, Burstin H. A call for outcomes research in medical education. *Acad Med*. 2004; 79: 955-60.
- Cook DA, Bordage G, Schmidt HG. Description, justification, and clarification: a framework for classifying the purposes of research in medical education. *Med Educ*. 2008; 42: 128-133.
- Egan-Lee E, et al. Twelve tips for ethical approval for research in health professions education. *Med Teach*. 2011; 33: 268-72.
- Evans KH, et al. An innovative blended preclinical curriculum in clinical epidemiology and biostatistics: impact on student satisfaction and performance. *Acad Med*. 2016; Epub ahead of print.
- Glassick CE. Boyer's expanded definition of scholarship, the standards for assessing scholarship, and the elusiveness of the scholarship of teaching. *Acad Med*. 2000; 75: 877-80.
- Gray BM, et al. Association between imposition of a maintenance of certification requirement and ambulatory care-sensitive hospitalization and health care costs. *JAMA*. 2014; 312: 2348-2357
- Hanson JL, Balmer DF, Giardino AP. Qualitative research methods for medical educators. *Acad Pediatr*. 2011; 11: 375-86.
- Hurley RE. Qualitative research and the profound grasp of the obvious. *Health Serv Res*. 1999; 34: 1119-36.
- Kanter SL. Toward better descriptions of innovations. *Acad Med*. 2008; 83: 703-4.
- Kern DE, Thomas PA, Hughes MT. Curriculum development for medical education: A six-step approach. 2<sup>nd</sup> Edition. 2009. The Johns Hopkins University Press. Baltimore, MD.
- Kirkpatrick DL. Evaluation of training. *Training and development handbook*. 1967. McGraw-Hill. New York, NY. 18-1.
- Miller GE. The assessment of clinical skills/competence/performance. *Acad Med*. 1990. 65 (9 Suppl): S63-7.
- O'Malley PG, Pangaro LN. Research in medical education and patient-centered outcomes: shall ever the twain meet? *JAMA Intern Med*. 2016; 176: 167-8.
- Peshkin A. The goodness of qualitative research. *Educ Res*. 1993; 22: 23-29.
- Schumacher DJ, Lewis KO, Burke AE, et al. The pediatric milestones: initial evidence for their use as learning road maps for residents. *Acad Pediatr*. 2013; 13: 40-7.

