You can be a successful educational scholar: Developing your scholarship roadmap through use of expert research mentoring

A Collaboration between the APPD Research and Scholarship & Faculty Development TaskForces
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Workshop Facilitators

- Erika Abramson, MD, MS – Weill Cornell Medical College
- Marsha Anderson, MD - University of Colorado
- Su-Ting Li, MD, MPH - University of California Davis
- Tai Lockspeiser, MD - University of Colorado
- John Mahan, MD - Nationwide Children’s/Ohio State U
- Heather McPhillips, MD, MPH - University of Washington
- Renuka Mehta, MBBS, MRCP, DCH - Medical College of Georgia
- Monique Naifeh, MD, MPH - University of Oklahoma
- Aditee Narayan, MD, MPH - Duke University
- Heidi Sallee, MD - Saint Louis University
- Theodore Sectish, MD - Harvard/Boston Children’s Hospital
- Janet Serwint, MD - Johns Hopkins University
- Sharon Smith, MD - University of Connecticut
- Nancy Spector, MD - Drexel University
- Teri Turner, MD, MPH, MEd - Baylor
- Linda Waggoner-Fountain, MD, MEd - University of Virginia
Disclosures

• We have no relevant financial relationships to disclose.
• We have no conflicts of interest to resolve.
Objectives

- Differentiate the key types of medical education scholarship
- Identify the characteristics of a SMART research question and common study designs used in educational scholarship
- Create a roadmap for carrying out your own scholarly project
- Refine your scholarship approach through peer and expert mentorship
Educational Scholarship

• *Discovery* of new knowledge
  – Traditional hypothesis-driven research

• *Integration* of new discoveries
  – Synthesis of existing knowledge
  – Application to important problems

• *Teaching* of new knowledge and discoveries
  – Effective dissemination of new knowledge to others

Standards of Quality Scholarship

- Clear Goals
- Adequate Preparation
- Appropriate Methods
- Significant Results
- Effective Presentation
- Reflective Critique

Getting Started

• Mentor
  – Career or academic mentor
  – Research mentor
  – Inside OR outside your institution
  – Identify early

• Collaborators
  – Colleagues
  – Trainees
  – Inter - disciplinary “team”
  – Statistician (involve WHEN developing your question!)
Asking an I- SMART Research Question
Start with the Research Argument

1. The problem in the universe
   – What is wrong, undesirable, or unknown about the way things work?

2. The unknown
   – What is known in the literature?
   – What is unknown?

3. How will your research fill those gaps?
• The first part of convincing your audience that your study is important is convincing them that the underlying problem is important.

• If a study is not worth doing, it is not worth doing well
Understand the Existing Scholarship

• What has already been done?

• Where are the gaps in knowledge?

• How can your work build on the work of others?
Searching the Literature

• **PubMed** isn’t always enough for educational research
  - **Best Evidence Medical Education Collaboration**
    - [www.bemecollaboration.org/](http://www.bemecollaboration.org/)
  - **ERIC** -- National Education Database
  - **PsycINFO** – citations related to psychology and other disciplines including education and medicine
  - **Google Scholar**
Searching for additional resources

• **MedEd PORTAL**
  • Peer reviewed publications of medical education teaching and assessment resources

• **APPD Share Warehouse**

• **MERLOT**
  – Similar to MedEd PORTAL but for all of higher education
The Research Question

• You have a compelling research argument, but is this the right research question?
The I-SMART Research Question

- **I** – Interesting to you
- **S** - Specific, Simple to Understand
- **M** - Measurable
  - Able to assess pertinent variables and outcomes
- **A** - Achievable
  - Within a reasonable timeframe to stakeholders
- **R** - Relevant and not Rehashing
  - Adds to existing knowledge
- **T** - Timely
  - Obtain relevant answers within a specified period
Types of Research Questions

• Exploratory (“The What” Questions)
  – Seeks to gain an understanding of a new topic

• Descriptive (“The How and Who” Questions”)
  – Presents a picture of a specific situation

• Explanatory (The “Why” Questions”)
  – Identifies the reasons why certain things occurs
Research is an Iterative Process

- It can take weeks to refine a research question.
- It can take a career to ask and answer the question you’ve always wanted to ask.
Road Map to Success

1. Develop a question or specific aim
   I-SMART: interesting, specific, measurable, achievable, relevant, timely
   (“anyone can make a guess, only a scientist can make a hypothesis”)

2. Choose a Design
   Qualitative, cross-sectional, RCT, quasi-experimental, single subject, etc.

3. Implement
   Conduct intervention; collect data

4. Evaluate outcome(s)
   Results, data, statistics

5. Export results
   Abstract, manuscript, new or changed policy, curriculum development
Choosing a Study Design
## From Study Question to Study Design

<table>
<thead>
<tr>
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<th>Study Design</th>
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<td>Descriptive, Qualitative</td>
<td>• Ethnography</td>
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<td>• Grounded Theory</td>
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<tr>
<td>Test a hypothesis? (Explanatory)</td>
<td>Hypothesis-Driven, Quantitative,</td>
<td>• Experimental (RCT)</td>
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<tr>
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<td>• Quasi-experimental (nonrandom control)</td>
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<td>• Single Subject (pre/post test)</td>
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<td>• Cohort / Causal Comparative</td>
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Kirkpatrick’s Outcomes Hierarchy

- **Reaction**
  - Satisfaction, Preference

- **Learning**
  - Attitude, Skills, Knowledge

- **Behavior**
  - Impact on clinical practice

- **Results**
  - Impact on patients

Beckman TJ and Cook DA. Developing scholarly projects in Education: A primer for medical teachers. In Medical Teacher, 2007
Important Definitions

Quantitative Designs:
• Outcome = Dependent Variable and is Conceptual
  
  Example: Learner knowledge

• Method = General approach to assess the outcome
  
  Example: multiple-choice test

• Instrument = specific devised for systematically collecting data (preferably validated tool if exists)
  
  Example: In-training exam score

Explanatory designs:
• Study Intervention = the independent variable

  Example: Longitudinal board preparation course as R2
Great Idea to Innovative Project

• Problem Statement: Residents and Nurses need to collaborate for optimal care but do not always understand each other’s role or work flow.

• Idea: You have found a ½ day during an inpatient rotation where each intern will shadow a nurse to improve collaborative care
Innovative Project to Scholarly Product

• Literature Review reveals no similar published experience, a few validated tools on MD/RN communication, very little on resident/nurse collaboration

• How will you know if this program is worth the time residents will be giving up on the wards?
  – And how will you get academic credit for the work plus share with others in GME?
What question(s) might you ask?
How will you measure success?

For your assigned study design (descriptive, quasi-experimental, cohort, RCT)

What is your outcome?   \textit{Example: Communication Skills}

What is your method?   \textit{Example: Video-taped encounter}

What instrument to use?   \textit{Example: Validated behavior check list}
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Tips

• Always look for opportunities to turn your work into scholarship
• Clearly define your research question, outcome, and resources to help define your research question
• Think about ways to improve the rigor of your educational scholarship
• Draw upon your resources early and often:
  – Consult with experts
  – Find existing, validated tools and use or incorporate those as possible
  – Perform pilot studies
Study Design 101

• Audience Response System tutorial
  – Please use your phone to respond to the questions during this portion of the workshop.

  • Use your phone to text your answer to 37607
This image is a poll’s place holder. Enter slide show mode (F5) to view your live poll.

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Make sure you’ve installed the PollEv Presenter app (pollev.com/app) and are connected to the internet!

If you need to duplicate this poll make sure to copy/paste the entire slide (not just the place holder image).
Study Designs 101

• Title: Self Assessment on the Competencies and Reported Improvement Priorities for Pediatric Residents

• Objective: Identify factors associated with resident self-assessment of the competencies, and to determine whether residents chose areas of self assessed weakness as areas for improvement in their Individualized Learning Plan.
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Study Design 101

• Methods:
  – Analysis of the existing de-identified AAP PediaLink ILP database for the 2009-2010 academic year was performed.
  – As part of the ILP
    • Residents self-assessed their competence on the 6 ACGME competencies.
    • Residents self-assessed the relative strength of the 10 personal attributes.
    • Residents selected subcompetencies and personal attributes they wanted to focus on for improvement.
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Study Design 101

• Strengths of this Study Type
  – Data can be gathered quickly
  – Relatively inexpensive to complete
  – No loss to follow-up

• Weaknesses of this Study Type
  – Does not establish the sequence of events
  – Only gives information about prevalence
Study Design 101

• Title: Better rested, but more stressed? Evidence of the effects of resident work hour restrictions

• Objective: To determine the impact of a new schedule on interns’ quality/quantity of sleep and perceptions of educational quality.
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Study Design 101

– Methods: Revised schedule for one general pediatrics team and kept the other two teams with same schedule

– All interns completed
  • Daily work hour and sleep logs
  • Survey at the end of the rotation
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Quasi-Experimental Study Design

Target Population

Study group A
Baseline data (pre test)
Intervention
Outcome (post test)

Study group B
Baseline data (pre test)
“Standard” treatment
Outcome (post test)

O1
X
O2

Time
Study Design 101

• Strengths of this Study Type
  – Control group – more practical than RCT

• Weaknesses of this Study Type
  – Confounders – need to control for baseline differences and impact of other variables
  – Need appropriate power to see differences
Study Designs 101

• Title: Can Incorporating Inpatient Overnight Work Hours Into a Pediatric Clerkship Improve the Clerkship Experience for Students?

• Background: New incorporation of M3s into pediatric resident night-float teams

• Objective: study the effects of the new schedule on
  1) cognitive performance
  2) number of new admissions
  3) clerkship satisfaction
  4) amount & quality of resident teaching
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Study Designs 101

• Methods:

• Part 1 – Retrospective historical controls study
  – 4 weeks of inpatient plus 5 calls
  – 3 weeks of inpatient plus five consecutive night calls

• Part 2 – Two-item survey with open-ended comments to students
  – Amount of resident teaching time
  – Quality of resident teaching
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Case-Control Study Design

• Strengths
  – Observational by design
  – Generally quick, cheap and easy to perform
  – Sometimes performed as initial studies to establish potential associations before undertaking larger & more expensive studies

• Weakness
  – Controls cannot be exposed to the intervention which is a challenge if you or IRB thinks it is good for the students’ education
Standards of Quality Scholarship

• Clear Goals
• Adequate Preparation
• Appropriate Methods
• Significant Results
• Effective Presentation
• Reflective Critique

Clear and important goals

• Important goal
  – Identify the gap
  – Why is it important to fill the gap?

• I-SMART goal

“It’s true that by blundering about we stumbled on gold, but the fact remains that we were looking for gold” – Francis Crick
Adequate preparation

• Know your area of scholarship
  – Understand the edge of knowledge
  – Identify gaps – and which are important to fill

• Acquire necessary skills

• Acquire necessary resources
  – Collaborators
  – Statistical support
  – Qualitative expertise
Appropriate methods

• Methods should map back to goals
  – Are the research methods appropriate to answer the research question?
  – Are teaching/curricular methods appropriate?
  – Do evaluation methods map back to the learning objectives?

• Effectively apply methods

• Modify methods as circumstances change
Significant Results

• Outcome should be significant
  – How important is it?
  – Is it recognized by others?
  – Do you build on the work of others?
  – Can others build on your work?

• Ensure significance by carefully evaluating goals, gap, and the importance of filling the gap.
Clear communication

• Match dissemination to type of scholarship
  – Public dissemination
  – Peer Review
  – ReProducible
  – Platform on which others can build
Reflective critique

• Critically evaluate your work
  – Don’t overstate your findings
  – Compare your findings with prior scholarship
  – Discuss limitations of your work
  – Discuss next steps

• Value and consider the opinion of others to improve your work

• Use reflective practice to guide and improve quality of future work
Please give us feedback!

- https://www.appd.org/amsurvey/