

A Six Step Process to Developing an Educational Research Plan



Stephen C. Charles, MS, MABMH, PhD, CHSE
Assistant Dean for Outcomes and Assessment
Brody School of Medicine, East Carolina University

Copyright 2016

East Carolina University- Brody School of Medicine
Reproduction is granted with permission

TABLE OF CONTENTS

	Page
Introduction	3
Session Overview/Content Description Objectives	3
Outline of Workshop	3
Session Learning Objectives	3
Content of Workshop	4
Introduction	4
Importance of Educational Research	4
Step 1: Identifying a Problem	4
Step 2: Reviewing the Literature.....	5
Step 3: Specifying a Research Purpose	7
Step 4: Designing a Study	7
Step 5: Analyzing and Interpreting the Data	14
Study Design Template	15
Step 1: Identifying a Problem	15
Step 2: Reviewing the Literature	16
Step 3: Specifying a Purpose for Research	17
Step 4: Designing a Study	17
Step 5: Analyzing and Interpreting the Data	19
Step 6: Reporting Research	21
Medical Education Publications	22
Medical Education Funding Sources.....	23
Glossary	24
References	25

INTRODUCTION

Session Overview / Content Description:

In this session participants will learn how to create and develop an educational research plan. They will draft their own educational research question and study design. Finally participants will learn how to turn their research into a publishable manuscript and survey likely funding sources.

Outline of Workshop Session:

Agenda
Introductions <ul style="list-style-type: none">• Introductions
Descriptions of Stepwise Process to Develop an Educational Research Plan <ul style="list-style-type: none">• Identifying an Educational Problem• Reviewing the Literature• Specifying a Research Purpose• Designing a Study
Individual Active Learning Exercise
Report Back on Individual Progress
Turning research into a publishable manuscript
Wrap Up and Evaluation

Session Learning Objectives:

At the end of this session, the participants will be able to:

1. Critically apply a stepwise process to identify promising educational projects.
2. Develop an effective educational research plan.

CONTENT OF WORKSHOP

Introduction

This workshop will describe a stepwise process on how to turn educational problems into scholarly research. Then participants will begin developing their own educational research project using a template provided in this manual.

Importance of Educational Research

Education research leads to new knowledge about teaching, learning, and educational administration. The goal of educational research is to generate knowledge that describes, predicts, improves, and explains processes and practices related to education (Gall, Gall, and Borg, 2007). Developing and implementing an educational study plan can lead to increased faculty scholarship (grants, poster/oral presentations, and publications). This scholarship can be used to meet promotion and tenure requirements.

Steps to Conducting Educational Research

What are the steps to conducting educational research?

Since educational research is systematic there are basic steps to plan conduct a study. These include:

- Identifying a Research Problem
- Reviewing the Literature
- Specifying a Research Purpose
- Designing a Study
- Analyzing and Interpreting the Data
- Reporting Research

Step 1: Identifying a Problem

How to identify a problem?

A **research topic** is the *broad* subject matter addressed by the study (Creswell, 2015). Examples of medical education research topics are as follows:

- Recognizing ethical issues occurring in the clinical setting
- Evaluating physical exam skills

Identifying a **research problem** consists of *specifying* an issue to study, developing a justification for studying it and suggesting the importance of the study for select audiences (Creswell, 2015). Examples of medical education research problems are:

Copyright 2016

- Medical students are not recognizing ethical issues in the clinical setting.
- Faculty do not know what students observe during an ophthalmological exam.

These educational research problems arose from faculty members expressing concerns about the research topics.

Identification of a research problem should include evidence on why the problem is important. Evidence can come from following:

- Other researchers and experts as reported in the literature
- Experiences others have had in the workplace
- Personal experiences

After identifying a research topic and problem, a target audience should be identified. Who will read and benefit from this research study?

Step 2: Reviewing the Literature

What is a literature review and why is it important?

A **literature review** is a summary of journal articles, books, and other documents that describes the past and current state of information on the topic of the research study. The purpose of the literature review is to document what the study adds to the existing literature and to ensure you are not “reinventing the wheel.” The literature review informs the researcher on how other research studies have been conducted and help locate models relevant to the study. (Creswell, 2015).

The following are four components to conducting a literature review:

1. Identify key terms related to the educational research problem.

Note: Topic areas usually consist of two or three key words. Use these as a starting point to start your search and then use the literature to identify other key terms. I start out using PubMed and ERIC database searches. Other databases include Google Scholar, Proquest, and Web of Science

2. Locate literature about a topic by consulting several types of databases.

Note: Patty Shay in the Farha Library can help with this process, especially if it involves finding print sources not readily available in the library such as books, articles, etc.

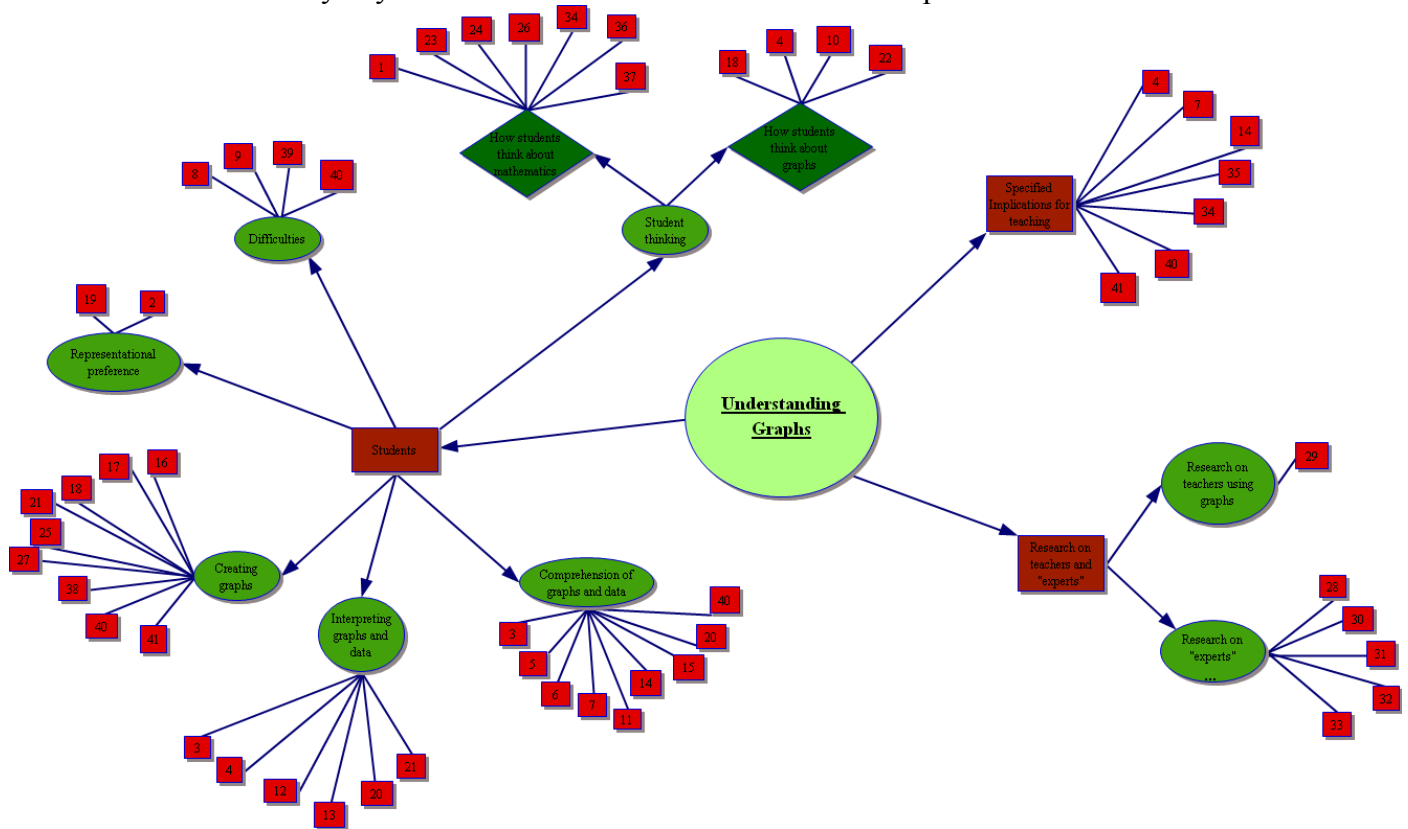
3. Critically evaluate and select the literature related to the educational research problem.

Note: It is best to always use primary sources. **Primary sources** are literature reports by the individual who actually conducted the research. **Secondary sources** are sources that summarize primary sources. Sometimes secondary sources do not accurately reflect the primary sources.

4. Organize the literature by dividing them into broad categories.

Note: I have found it is best to create a diagram or outline of your literature review before implementing the project. I start with broad topics and group literature accordingly. I then break the topics down further, as shown below:

Identify key terms related to the educational research problem



This concept map is created from a software package called CMAP, a free online tool to help create maps/hierarchical designs. The numbered boxes indicate a label for individual articles. (Lee, 2010).

Step 3: Specifying a Purpose and Research Questions

Writing purpose statements, research questions, and hypotheses provide critical direction to an educational research study. They identify questions that the researcher will answer through the data collection process.

The **purpose statement** provides the overall direction or focus of the educational research study (Creswell, 2015). Below you will find purpose statements for the two previous research studies mentioned in this manual.

- The purpose of this study is to identify what, if anything, students see when they complete an ophthalmologic exam.
- The purpose of this study is to determine how direct a storyline must be for a medical student to recognize an ethical issue with a patient.

Research questions narrow the purpose statement. These questions should be developed before identifying the methods of study (Creswell, 2015). There are typically multiple research questions for each study. For example, the following are the research questions used in the ethical issue case mentioned in Step 1:

- Does the student recognize the ethical issue?
- Does the student engage the ethical principle?
- Does the student propose treatment?
- Does the student document the ethical issue as a problem?
- Does the Standardized Patient (SP) observe any difference in students?
- Do the students feel prepared to address the case?
- What in the students' training helped them be prepared for the case?

Step 4: Designing a Study

How does the researcher choose a research methodology?

At this point, a decision about what type of research is most appropriate to best answer the research questions developed in Step 3 is needed. Research can be categorized multiple ways but for this workshop, I will discuss three types of research methodologies: quantitative, qualitative, or mixed methods. **Quantitative research** is a means for testing objective theories by examining the relationship among variables. **Qualitative research** is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. Qualitative research is best used to understand concepts and phenomenon, especially if little research has been done on the topic and research problem. Qualitative methodology is useful if the researcher does not know important variables to examine. **Mixed methods research** is an approach to inquiry that combines both qualitative and quantitative measures. Mixed methods research is used when the quantitative or qualitative research approach by itself is not adequate

Copyright 2016

to best understand a research problem or when the strengths of both quantitative and qualitative research methodologies provide the best understanding of the research problem (Creswell, 2009). A list of strengths and weaknesses of these methodologies is provided in the tables below:

Strengths of the Three Research Methodologies		
Quantitative	Qualitative	Mixed Methods
Tests hypothesis that are constructed prior to data being collected	Responsive to changes that occur during the study and may shift focus of their studies as a result	Can use the strengths of each method to overcome the weaknesses in another method
Can generalize research findings when the data are based on random samples of sufficient size	Explain how and why phenomena occur in the participants own words	Can generate and test a grounded theory
Eliminate or reduce confounding variables	Describes complex phenomena	Answers broader and more complete range of research questions
Provides precise numerical data	Provides a tentative but explanatory theory about phenomenon	Can provide stronger evidence for a conclusion (triangulation)
Data collection time is less time consuming	Data collection is in naturalistic settings	Adds insights that might be missed by utilizing only one method
May have higher credibility with administrators, politicians, and funding agencies	Identifies contextual and setting factors as they relate to the phenomena of interest	Increases the generalizability of the results
Useful to study large numbers of people	Useful to study a small number of people	Produces a more complete knowledge necessary to inform theory and practice

(Johnson & Christensen, 2004, p. 411-414)

Weaknesses of the Three Research Methodologies		
Quantitative	Qualitative	Mixed Methods
Researcher may miss out on phenomena occurring because of the focus on theory or hypothesis testing rather than hypothesis generation (confirmation bias)	Knowledge produced may not generalize to other people or other settings	Researcher has to learn multiple methods and approaches and understand how to appropriately mix them.
Knowledge produced may be too abstract and general for direct application to specific local situations, contexts, and individuals	It may have lower credibility with administrators, politicians, and funding agencies.	It is more expensive
	It takes more time to collect data than quantitative research	It is more time consuming than other methods
	Data analysis is time consuming	Newer type of research
	Results can be more influenced by researcher's personal biases and idiosyncrasies	

(Johnson & Christensen, 2004, p. 411-414).

Who are the participants of the study?

When designing a study, the researcher needs to include a detailed description of the participants. This detailed description will include the following:

- Population characteristics (age, gender, year in medical school, etc.)
- Rationale about why the researcher will be selecting these participants
- Participant recruitment and any incentives for completing the study

An example of a description of research participants might be as follows:

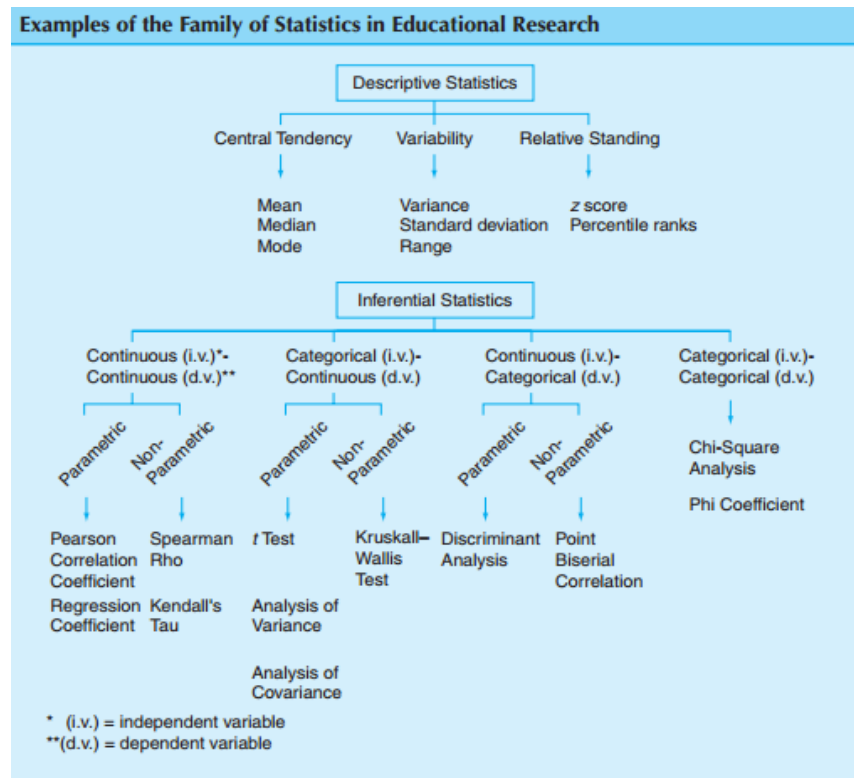
The research participants in this study will be 68 third year medical students at KUSM-W. These students are required to take a Clinical Skills Assessment (CSA) exam at the end of the third year. One of these cases will be the research case on recognizing and addressing ethical concerns. Therefore, only third year medical students will participate in this study. All 68 students will be asked for their consent to participate in this research project. All students will see the case, but only those consenting to participate in this study will have their data analyzed. Students will not receive any incentives for participating in this study and their grades will not be affected because they chose to or chose not to participate in this study.

Data Collection Plan

The researcher needs to identify data collection methods during the design of the study. These methods will depend on whether you are using quantitative, qualitative, or mixed methods research. For example, if you are using quantitative research methods a survey tool, assessment, or other quantifiable educational source can be used to collect data. If you are using qualitative research methods then interviews, open-ended survey documents, and observations are appropriate. If any these documents were created by the researcher there should be pilot study data describing steps implemented to ensure that the document was valid and reliable. The data collected in these documents should be related back to each research question to ensure that each research question will be answered with data from the study (Creswell, 2015).

Quantitative Data

In quantitative studies, there are two main types of analysis: descriptive and inferential. **Descriptive statistics** indicate general trends in data (mean, median, mode), the spread of scores (variance, standard deviation, and range), or a comparison of how one score relates to all others (z score or percentile rank) (Creswell, 2015). **Inferential statistics** infer characteristics of populations based on samples (Johnson and Christensen, 2014). In order to help determine the right inferential statistical procedure for your study, identification of the independent and dependent variable is needed. An independent variable (IV) is an attribute or characteristic that influences or affects an outcome. A dependent variable (DV) is the presumed to be influenced by one or more independent variables (Creswell, 2015). The chart below will help determine which analysis procedure is most appropriate.



(Creswell, 2015, p.182)

Note: Rosey Zackula in the Office of Research has been instrumental with providing guidance and resources to help with choosing the correct quantitative analysis measures.

Qualitative Data

Qualitative data collection methods involve observations, interviews, documents, and audio-visual materials. Researcher created questions or documents (such as focus group scripts) should be vetted by content experts and piloted before using. Once the data has been recorded and/or transcribed, content analysis can begin. Content analysis is designed to yield valid replicable inferences from the text, retaining the context in which comments were made (Krippendorff, 2004). Content analysis by hand (traditional text analysis) is my preferred method; however computer software programs are available to complete this analysis (*Atlas.ti*, *HyperRESEARCH*, *MAXQDA*, and *Nvivo*). When using computer software, there is a risk of losing contextual meaning. The researcher has to be very specific when using the computer software. When analyzing qualitative data by hand, at least two qualitative researchers are needed. The researchers evaluate data and identify themes individually. The individual themes are compared and discussed between the two researchers. The researchers then agree on themes and a definition of those themes. If the two researchers cannot reach a consensus then an outside

Copyright 2016

researcher should be brought in to help resolve the disagreement. Once the final themes have been identified, the qualitative data is recoded individually. When the two researchers have finished coding the second round, inter-rater reliability can be calculated using Cohen’s kappa with a minimum acceptable values of 0.80 between raters (Wood, 2007).

Inter-rater reliability is a statistical procedure to determine if two or more observers are similar (Creswell, 2015). The table below provides an example of multiple themes identified in a research study inquiring about what characteristics fourth year medical students value in mentor/s.

Characteristics Fourth Year Medical Students Value in a Mentor		
Theme Code	Description of Theme	Frequency
Mentee Recognizes Professional Characteristics as Important	The mentor is experienced in their specialty, recognized as an expert in their field of study, share networks and seen as career role model.	22
Mentee Recognizes Personal Characteristics as Important	These are characteristics that describe the mentors intrinsic qualities, investment of time into mentee, work/life balance, and religious interests.	17
Mentee Recognizes Peer Mentoring as Important	This is a mentor that is similar in age, power, and experience and has achieved academic success.	2
Other	These are comments not related to the question or personal experiences not answering the question.	6

(Charles, 2014)

The inter-rater reliability was 0.899 for the overall research question. While this means the researchers were not in perfect agreement, this value was above the lower limit of 0.80. The researchers discussed the discrepancies and reached a consensus on the appropriate theme for each comment.

Note: Cari Schmidt, PhD in the Office of Research has been instrumental with providing guidance and resources to help with qualitative analysis.

Mixed Methods Approach

If the researcher is using a mixed methods approach, a decision must be made whether the data will be collected in phases or concurrently. If the data is going to be collected in phases the researcher will need to decide which phase comes first. A researcher may decide to have the quantitative results first if they would like to explore any surprising results with qualitative data. However, if the researcher would like to have qualitative data first and follow up with a quantitative methodology, it can be done. The purpose of the qualitative results first is typically to explore a phenomenon. In addition, the researcher may decide to have both quantitative and

A Six Step Process to Developing an Educational Research Plan

2016

qualitative data collection occur simultaneously. The concurrent method allows for both methodologies to be compared noting if there is convergence, differences, or some combination of both (Creswell, 2009).

How does the researcher summarize the design of an educational research study?

I have found the easiest way to summarize and ensure that all research questions will be answered is to create a chart. This chart will align research questions with data collection methods, the exact location of data, and data analysis methods. See the table below for an example:

Aligning Research Questions with Data Collection and Analysis Methods			
Research Questions	Data Collection Method	Exact location of Data	Analysis Method
Does the student recognize the ethical issue?	<input checked="" type="checkbox"/> SP Checklist <input checked="" type="checkbox"/> Faculty PEN Checklist <input checked="" type="checkbox"/> Faculty Observation Checklist <input type="checkbox"/> Student Supplemental Survey	SP Checklist Question # 6 Faculty Pen Note Checklist Question #1 Faculty Observation Checklist Question #6	Frequencies, Means, Inter-rater Reliability
Does the student engage the ethical principle (with the SP)?	<input checked="" type="checkbox"/> SP Checklist <input checked="" type="checkbox"/> Faculty PEN Checklist <input checked="" type="checkbox"/> Faculty Observation Checklist <input type="checkbox"/> Student Supplemental Survey	SP Checklist Questions # 5, 8, 16 Faculty Pen Note Checklist Question #2 Faculty Observation Checklist Questions #5, 8, 16	Frequencies, Means, Inter-rater Reliability
Does the student propose treatment?	<input checked="" type="checkbox"/> SP Checklist <input checked="" type="checkbox"/> Faculty PEN Checklist <input checked="" type="checkbox"/> Faculty Observation Checklist <input type="checkbox"/> Student Supplemental Survey	SP Checklist Questions #4, 17, 18 Faculty Observation Checklist Questions #4, 17, 18 Faculty PEN Note Checklist # 4	Frequencies, Means, Inter-rater Reliability
Does the student document the ethical issue as a problem?	<input type="checkbox"/> SP Checklist <input checked="" type="checkbox"/> Faculty PEN Checklist <input type="checkbox"/> Faculty Observation Checklist <input type="checkbox"/> Student Supplemental Survey	Faculty PEN Checklist Question #3	Frequencies, Means
Does the SP observe any difference in students?	<input checked="" type="checkbox"/> SP Checklist <input type="checkbox"/> Faculty PEN Checklist <input type="checkbox"/> Faculty Observation Checklist <input type="checkbox"/> Student Supplemental Survey	SP Checklist Questions # 1 – 20 and comments	Frequencies, Means, Analyze for Themes
Do the students feel prepared to address this case?	<input checked="" type="checkbox"/> SP Checklist <input type="checkbox"/> Faculty PEN Checklist <input checked="" type="checkbox"/> Faculty Observation Checklist <input checked="" type="checkbox"/> Student Supplemental Survey	SP Checklist Question # 20 Faculty Observation Checklist #20 Student Supplemental Survey Question # 1	Frequencies, Means, Analyze for Themes
What in the students' training helped them be prepared for this case?	<input type="checkbox"/> SP Checklist <input type="checkbox"/> Faculty PEN Checklist <input type="checkbox"/> Faculty Observation Checklist <input checked="" type="checkbox"/> Student Supplemental Survey	Student Supplemental Survey Question #2	Frequencies, Means, Analyze for Themes

Step 5: Analyzing and Interpreting Data

Once data have been collected, the researcher should prepare the data for analysis. This includes removing inconsistent or incomplete data and making sure data is in an organized manner to be analyzed by a software program or by qualitative researchers. After the data is organized, it can be analyzed using the methods identified in Step 4 of this workshop. As a researcher, check again to make sure you are completing the correct statistical analysis for each research question.

Analyzing Data for Quantitative Methods

If using quantitative methods, the researcher should conduct descriptive and inferential analysis as appropriate. If you use inferential analysis, this could potentially use several of the following procedures in addition to the ones described in Step 4. The procedures include: determining p values, setting a confidence interval, and calculating an effect size. **Confidence intervals** are the range of the upper and lower sample statistical values that are consistent with the observed data and are likely to contain the actual population mean. **Effect size** is a way to identify the strength of the conclusions about group differences (Creswell, 2015).

Note: Rosey in the Office of Research can help you calculate p values, confidence intervals, and effect size.

Once the data are analyzed, the researcher will need to present the results in tables and figures. A description of the results should accompany these tables and figures. This requires the researcher to interpret the results for significance. The analysis and interpretation of the results will be discussed further in Step 6 of the study design template.

Analyzing Data for Qualitative Methods

If using qualitative methods, data may need to be transcribed or organized then analyzed as outlined in Step 4. If you are using a computer program, there is still a need to make sure themes are valid and reliable. After the final analysis, make an interpretation of the results which includes developing comparisons between findings and literature and suggesting limitations and future research (Creswell, 2015). The analysis and interpretation of the results will be discussed further in Step 6 of the study design template.

STUDY DESIGN TEMPLATE

Step 1: Identifying a Research Problem

1. What is an area of concern (topic) in your course/clerkship/clinical setting?

2. What is the educational research problem for this study?

3. Why is this topic important to study (justification)?

4. Who is the target audience most interested in this research?

5. Should the problem be researched?

Question	Answer
Does your problem fill a gap or void in the literature?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does your problem replicate a past study but examines different participants and different research sites?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does the problem extend past research or examines the topic more thoroughly?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does your problem give voice to people silenced, not heard, or rejected?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Does the problem inform practice?	<input type="checkbox"/> Yes <input type="checkbox"/> No

If you checked yes to any of these questions, then you may proceed to study this research problem.

Step 3: Specifying a Purpose and Research Questions

1. What is the purpose of this study?

The purpose of this study is

2. What research questions are you seeking to answer?

A.

B.

C.

D.

E.

Step 4: Designing a Study

1. Thinking about your research problem, research questions, and the purpose of the study, which methodology is most appropriate for the study?

Quantitative

Qualitative

Mixed Methods

Not Applicable

2. Why did you to choose the type of research methodology?

3. Who will the participants in this study be?

4. How are these participants going to be selected to participate in this study?

5. Why were these participants selected?

6. Will the participants receive any incentive or benefits for participating in the study?

7. What instruments or survey tools will you use?

8. What evidence is available to show the instrument or survey tools are valid and reliable?

9. If using qualitative methods, determine if you are going to code themes by hand or computer.

Code by hand (Traditional Text Analysis)

Computer Software

10. If this study will implement a mixed method approach, what sequence will the quantitative and qualitative research occur in? Why did you make this choice?

Quantitative First

Qualitative First

Concurrently

11. Fill in the table below:

Aligning Research Questions with Data Collection and Analysis Methods

Research Questions	Data Collection Method	Exact Location of Data	Analysis Methods

Step 5: Analyze and Interpret Data

- 1. Organize and Clean Data.**
- 2. Analyze data using appropriate quantitative and qualitative analysis.**
- 3. If quantitative, determine the p-values, effect size, and confidence intervals.**

4. What are some of the most significant results (quantitative, qualitative, or both)?

5. What some of the comparisons between literature and findings?

6. What are the limitations of this study?

7. What are areas for future research?

Step 6: Reporting Research

Turning research into a publishable manuscript:

1. Define the proposed publication:
 - a. Construct a 1-page document with the following 3 sections.
 - i. Theme – What is the single, *most important outcome* of your research project that is of interest to, or important to, the field and/or the audience of the journal to which you will submit?
 - ii. Data – What are the individual data components that lead to the outcome in the theme, and to no other conclusion? Typically, no more than 4 or 5 components of evidence.
 - iii. Conclusion – A short paragraph that explains why the evidence leads to the outcome addressed in the theme and to no other conclusion.
2. Follow the “*Instructions for Authors*” provided by the journal to which you will submit.
3. Be *concise* and *to the point*. Scientific publication is not a place for flowery prose.
4. Typical construction:
 - a. Abstract – Write this last. It is a synopsis of what you write in the rest of the manuscript. Adhere strictly to the word limits.
 - b. Introduction – a tightly focused and concise account of the key literature that relates to the theme of the manuscript.

You will have read much more than you cite in the introduction. This is not the place to wow the reviewer or your readers with how much you’ve read.
 - c. Methods – Describe exactly what you did to complete the research project as concisely as possible. From your description an educated reader should be able to reproduce the study that you conducted, including control groups.

Pitfall: You know your research so well that beginners often jump right into a discussion of the nuances and difficulties they mastered without providing a full account of what they did.
 - d. Results – This is where you describe the data that you’ve gathered, typically in summary form as graphs or tables.
 - e. Discussion – Much like 1.iii., above, this is where you explain why your data leads to the conclusion(s) that you’ve drawn. You can discuss the strengths of your approach, how it agrees or disagrees with literature cited in the *Introduction* and reasons why. You should also discuss the strengths and any shortcomings of your approach as well as next steps for this line of inquiry.

MEDICAL EDUCATION PUBLICATIONS

2012 impact factor included in parentheses when available. * = unofficial impact factor.

[Academic Medicine](#) (3.524)

[Advances in Health Sciences Education: Theory and Practice](#) (2.089)

[Advances in Physiology Education](#) (1.547)

[BMC Medical Education](#) (1.15*)

[Canadian Medical Education Journal](#)

[Clinical Teacher](#) (0.443*)

[Education for Health: Change in Learning & Practice](#)

[Evaluation & the Health Professions](#) (1.231)

[Focus on Health Professional Education](#) (0.882*)

[Journal of Advances in Medical Education and Practice](#)

[Journal of Cancer Education](#) (0.762)

[Journal of Continuing Education in the Health Professions](#) (1.521)

[Journal of Graduate Medical Education](#)

[Journal of Health Professions Education](#)

[Journal of Surgical Education](#) (1.376)

[Journal of the International Association of Medical Science Educators](#)

[Medical Education](#) (3.176)

[Medical Education Development](#)

[Medical Education Online](#)

[Medical Teacher](#) (1.217)

[Pédagogie Médicale](#)

[Perspectives on Medical Education](#)

[Postgraduate Medical Journal](#) (1.939)

[Simulation in Healthcare](#) (1.833)

[Teaching and Learning in Medicine](#) (0.748)

Source: <http://www.med.uottawa.ca/dime/eng/journals.html>, accessed 14 April 2015

MEDICAL EDUCATION FUNDING SOURCES

Hold CTRL and click on funding source name to access the web site.

[Agency for Healthcare Research and Quality \(AHRQ\) Grants](#)

[American Association of Neurology Educational Research Grants](#): (must be a member to apply)

[Arnold P. Gold Foundation](#)

[Arthur Vining Davis Foundations](#)

[Association of Professors of Gynecology and Obstetrics \(APGO\)](#)

Association for Surgical Education Foundation (an arm of the Association for Surgical Education (ASE), which awards grants in its CESERT program -- Center for Excellence in Surgical Education, Research and Training: <http://www.surgicaleducation.com/mc/page.do?sitePageId=28551&orgId=ase>

[AstraZeneca Medical Education Research Grants](#)

[Fund for the Improvement of Postsecondary Education \(FIPSE\)](#)

Henry J. Kaiser Family Foundation: <http://www.kff.org/>

HRSA - U. S. Department of Health and Human Services: <http://www.hrsa.gov/>

Josiah Marcy, Jr. Foundation: <http://www.josiahmarcyfoundation.org/apply/grant-programs>

National Institutes of Health: <http://grants1.nih.gov/grants/index.cfm>

[NIH NCCR Science Education Partnership Award \(SEPA\) \(R25\)](#)

NBME Stemmler Medical Education Research Fund: <http://www.nbme.org/research/stemmler.html>

NSF Directorate for Education and Human Resources: <http://www.nsf.gov/dir/index.jsp?org=EHR>

PEW Charitable Trust: <http://www.pewtrusts.com/>

Pfizer Medical Education Grants:

http://www.pfizer.com/responsibility/grants_contributions/medical_education_grants.jsp

RSNA Foundation Radiology Education Grants:

<http://www.rsna.org/Foundation/EducationScholarGrant.cfm>

<http://www.rsna.org/Foundation/EducationResearchDevelopmentGrant.cfm>

Robert Wood Johnson Foundation, The <http://www.rwjf.org/index.jsp>

Society for Academic Continuing Medical Education

Research Grants in Continuing Medical Education: http://www.sacme.org/SACME_grants

Source: <http://www.medicine.virginia.edu/administration/faculty/ade/Research/FundingSourcesforMedicalEducationResearch.pdf> ;
downloaded 14 April 2015

GLOSSARY

confidence intervals are the range of the upper and lower sample statistical values that are consistent with the observed data and are likely to contain the actual population mean (Creswell, 2015).

descriptive statistics indicate general trends in data (mean, median, mode), the spread of scores (variance, standard deviation, and range), or a comparison of how one score relates to all others (z score or percentile rank) (Creswell, 2015).

effect size is a way to identify the strength of the conclusions about group differences (Creswell, 2015).

inferential statistics infer characteristics of populations based on samples (Johnson and Christensen, 2014).

Inter-rater reliability is a statistical procedure to determine if two or more observers are similar (Creswell, 2015).

literature review is a summary of journal articles, books, and other documents that describes the past and current state of information on the topic of your research study (Creswell, 2015).

mixed methods research is an approach to inquiry that combines both qualitative and quantitative measures (Creswell, 2015).

primary sources are literature reports by the individual who actually conducted the research (Creswell, 2015).

purpose statement provides the overall direction or focus of the educational research study (Creswell, 2015).

qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem (Creswell, 2015).

quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2015).

research problems are educational issues, controversies or concerns studied by researchers (Creswell, 2015).

research questions are questions that narrow the purpose statement to specific questions that the

researcher seeks to answer (Creswell, 2015).

research topic is the broad subject matter addressed by the study (Creswell, 2015).

secondary sources are sources that summarize primary sources (Creswell, 2015).

REFERENCES

- Charles, S. (2014). *Perceptions of mentoring from fourth year medical students*. Retrieved from Proquest. <http://scholarcommons.usf.edu/etd/4998>
- Creswell, J. (2015). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (5th ed.). Boston, MA: Pearson Education, Inc.
- Creswell, J. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. Los Angeles, CA: Sage Publications, Inc.
- Gall, G., Gall, J., & Borg, W. (2007). *Education research: An introduction* (8th ed.). Boston, MA: Pearson Education, Inc.
- Johnson, B. & Christensen, L. (2004). *Educational research: Quantitative, qualitative, and mixed approaches*. (2nd ed.). Boston, MA: Pearson Education, Inc.
- Krippendorff, K. (2004). Reliability in content analysis: Some common misconceptions and recommendations. *Human Communication Research*, 30 (3), 411-433.
- Lee, H. (2010, April). *Using concept maps to organize reviews of literature*. For CAUSE Research Clusters.
- Wood, J. (2007). Understanding and computing Cohen's kappa: A tutorial. *WebPsychEmpiricist*. Retrieved January 10, 2015 from <http://wpe.info/vault/wood07/Wood07.pdf>