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Writer's Forum — Building consistency between title, problem statement, purpose, & research questions to improve the quality of research plans and reports

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Abstract

Consistency in the title, problem, purpose, and research question improve the logic and transparency of research. When these components of research are aligned research design and planning are more coherent and research reports are more readable. This article reviews the process for checking for and improving consistency. Numerous examples of consistency among these four components of research are provided and ways to remove inconsistency are outlined. A graphic, rubric and worksheet are provided to help researchers evaluate their own work or give feedback to the research work of others.

Keywords

Research, consistency, logic, writing up research

A good research plan or report, including a dissertation, has three basic characteristics or qualities, regardless of the topic or research methods. These common characteristics are: consistency between the components of the research plan or report, a logical trail of evidence, and transparency in reporting.

Consistency, logic, and transparency are crucial to research reports and researchers, who tend to focus on content and methodological concerns, need to look at the work through these three qualities. They can conceptualize, organize and report their findings in a way that convinces readers. Working on these three qualities in research helps to clarify how data was selected, collected, coded, analyzed and interpreted in a way to answer the research questions.

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Researchers must focus on these three qualities throughout the research process and in their reports but it is most crucial these are present from the start. First steps are very important, both for designing a plan and for reporting it to readers. If the research starts out attending to these three from the very beginning their process improves the final product. Then when the report is being written, getting consistency, logic, and transparency in the first several pages of a report helps the reader trust the research more. As such, systematic and obvious consistency, logical evidence and flow of ideas and arguments, honest statements and interpretations that show transparency, all strengthen research.

We focus here on one of these three qualities, consistency. We also only focus on it in the first four stages of research:1) title, 2) problem (the WHY), 3) purpose (the WHAT), and 4) research questions. By establishing, polishing and hammering out consistency in the first steps or stages of a research plan we believe logic and transparency are easier to create and the rest of the research and its resulting report will be of higher quality. Consistency saves a lot of side-tracking into areas not aligned with the topic, back-tracking when wrong directions force someone to go back to clarify an inconsistency, wasted reading, and even the need to re-collect data that does not address the title and purpose of the study.

We also focus on consistency because it is easier for a researcher to pull together logical evidence and transitions, and show transparency if their study starts out with a clear and focused direction. Below, we present examples and explanations of how to achieve this logical alignment between these first four steps or sections. We conclude with discussion of a small rubric we have developed to help evaluate and improve consistency in a report.

Consistency in the First Four Steps of Research

Consistency is about the logical alignment of the title, purpose, problem, and research question. This process begins when a researcher clearly identifies the concepts or constructs of interest and focuses on these constructs when reading literature to help formulate the topic, problem and purpose of the work.

A title contains the main ideas that guide the researcher's thinking. Titles capture the researcher's intent and makes clear to the reader what to expect in a manuscript. A good title helps the researcher to start planning the project. It may help in focusing on what literature to review, and what research methods may be appropriate. A well written title conceptualizes the problem and therefore can serve as an advanced organizer for the researcher and reader.

Eventually a title gets published and serves as a means of attracting others to read the research. It is the main item searched and read in library data bases. As such, careful wording of a title facilitates other researchers in finding and selecting topics of interest.

Don't let the apparent simplicity of writing a title fool you. It requires thoughtful consideration of how to best reflect the intent of the research. This may be facilitated by getting feedback from colleagues about what the title means or conveys to them. If their interpretation does not coincide with the researcher's intent, then a rewrite is necessary. We have seen researchers rewrite titles multiple times throughout the dissertation/manuscript process. Titles also change as the researcher more fully develops his or her study. As such, title development is an iterative process that the researcher continually refines and potentially modifies throughout the course of the work. In fact, even after publication we often consider how we would change our own titles or the titles of other manuscripts we have helped with, to better reflect the intended purpose of the research.

Despite the fact titles will change, the more time spent at the beginning to polish a title the better. It gives key words and relationships to include in the problem, purpose, question(s) and data plans. This is the power of the title. It not only summarizes but the iterative process works to keep the researcher on track.

So what makes a good title? A well-written title can be viewed as a summary of the summary, in that it conceptualizes and names the key unique components of the research plan, its data and findings. It is helpful to consider the four W's (Who, What, When, Where) and the one H (How) when formulating a title.

WHAT words are the most important words in a title as they report the main variables or constructs that are the focus of the study (trust, literacy, leadership behaviors, etc.). If one has two or three main variables each will need to be in the title. If there are many equally important variables, the title may have to summarize these into a topical word, like socioeconomic factors, relational variables, etc.

WHO words tell the reader the person or groups from which the data was collected. It is who is being studied such as k-4 paraprofessionals, 7th-grade science teachers, secondary school guidance counselors, university student service administrators, adult learners, human resource development practitioners etc.

WHERE words in a title tell the places where the study will be or was done. This could be at a mix of proper and general place names. For example "a California k-8 rural district", "Northeastern U.S. urban juvenile detention centers." Because of the increase use of global research, even generic types of places, like schools, need to be more detailed in their description. So "private colleges" is helpful but better if it actually is a "Catholic liberal arts college in the United States" because that better identifies where the data was gathered.

These three are the most important elements to include in the phrases and words in a title. However, at times, two lesser important components may also be in the title. Those are WHEN and HOW.

WHEN words are added to titles to frame specific periods in which data were collected. This is especially evident in historical research when reporting by years, like a study on college presidents from "1888-1920" but it could be based on monthly, weekly or daily factors, like "Monday morning tardies among school teachers." When can be connected to who or what issues as well, especially in studies targeting issues of development, like "teaching material development by teachers in their initial first five years of teaching."

HOW words tell about the study research design; the way it was structured and/or how data was collected. This is important as some researchers may be looking for findings based on specific types of data collection or analysis. Wording added to titles would be like "historical case study" or "focus group interviews" and "a delphi analysis technique." A reference to statistical techniques, especially of techniques that imply specific types of data collection and processing, are also useful to tell readers how data was collected and used.

We believe all titles should have either WHAT or WHO wording, and most will have both. A majority will also have WHERE or HOW. Only a few will have four or five of these elements. One of the factors working against including all in a title is space limitations. Titles can get too long and distract from cohesiveness. So attempts to be thorough must be balanced with attempts to be succinct. Many novice researchers are shocked by the length of research titles. However, as they search databases they will notice the trend toward making research article titles much longer than titles from magazine articles or trade books. Titles with 12 to 20 words are common.

Below are some titles that show good structure.

Van Dyke (2010) titled his study "Cosmological Beliefs about Origins Related to Science Achievement among Junior High School Students in South Bend, Indiana." This title was thorough but longer. It has four elements. WHAT elements dominate this title in cosmological beliefs about origins and science achievement. Science achievement was measured by state test scores as well as pre-and post unit tests from a science book but these individual items were grouped into one major construct named science achievement. The "other" factors were a mix of socioeconomic as well as school and teacher factors, but naming those would have added more words to an already crowded title. The WHO was junior high students and the WHERE was South Bend, Indiana (a physical proper

place) as well as in an "After-school School Science Unit" which was a program place. The study used a path analysis model and correlations but this HOW was NOT added to the title.

Crittendon (2009) had a comprehensive title, "Mixed-method Analyses of Federal Court Decisions During 1980–2007 Involving Race and Sex Discrimination Under Title VII of The Civil Rights Act of 1964 and Faculty Tenure Denial Decisions In Higher Education." The HOW shows up first in the phrase "mixed-method analyses" which suggest both qualitative and quantitative data was collected. The WHAT was detailed as race and sex discrimination federal course case decisions related to faculty tenure. The WHEN was 1980-2007. The WHO could be inferred to be FEDERAL judiciary. The WHERE was higher education and it is implied that it is in the U.S.

Lindemer's (2006) title was: "The Development of Rating Scales to Measure the Quality of Pre-School Literacy Environments: A Validity Study." Both the start and end focus on the methodological processes, and suggest technical manipulation of data, which indicates the HOW. This is even more evident with the phrases of "developing… scales" through a "validity study." The WHAT was "literacy environments" and WHERE is pre-schools. She could have also included where this was done, in the U.S. or in a certain region or state or even if it was done within a public school or private school context.

Goudy's (2005) title, "Teacher Trust In Building Principals: A Contextual Relationship to School Climate in K-4 Buildings," and Goodwin's (1985) title, "The Relationship Between Maternal Employment and Psychological Constructs: Self Concept and Family Orientation," clearly informs the reader of the WHAT and WHO. They show a focus of the studies, even though they do not have all of the suggested elements. However, these titles do clearly describe the intent of these research investigations.

The "Why" Section

The first sections of a research proposal are typically an introduction (background), purpose and problem statements that report the WHY and the WHAT will be done. The WHY section answers the "so-what" or "who cares" question. It introduces the need and importance of the study. Sometimes this section is called the purpose and sometimes it is labeled the background of the problem. We have also seen the WHY presented as an introduction ending with a problem statement. The actual name is not as important as is the content of this section.

The WHY section connects the reader to relevant literature, data, trends or related information that frames the basic need for and justification for the study. It presents the researcher's analytical thinking about previous research and weaves the literature together to create a basic argument and warrant for the research being proposed.

Johnson and Christensen (2000) described the WHY section as follows:

> In most studies the problem statement tends to be stated as the 'purpose of the research study.' Regardless of whether you make an exact statement of the research problem or a statement of the purpose of the research, this statement needs to be made because making it ensures that you have a good grasp of the specific problem you wish to investigate…. Providing the specifications of the study's purpose at the outset also has the advantage of guiding the research process…. (p.47)

When Maxwell and Loomis (2003) discuss writing this section they suggest asking and addressing the question: "Why is the study worth doing?" "They say purposes can be personal, practical or intellectual. All three kinds of purposes influence the rest of the research design." (p. 245). The WHY section introduces and states the importance (significance) of the study, even if this may be covered in more depth in a later section of the research manuscript.

A well-written WHY section reviews main literature and shows the researcher to be knowledgeable about what has been done in the field and clearly states how this research fills a gap or addresses an under examined area. It is not a full literature review, which in the dissertation is a separate chapter and in some journal articles also a separate section. This section more appropriately justifies the need to conduct the research and the reader's need to keep reading the report.

The WHY can also be explained based upon empirical arguments and/or theoretical needs. It should be made clear how the study makes a contribution to practice and/or to the development of theory.

An example of types of purposes that can justify a study are presented by Newman, Ridenour, Newman, & DeMarco, Jr. (2003), where they present at least nine purposes or the WHY for doing research. These purposes can be related to: 1) improving prediction; 2) increasing the knowledge base; 3) having a social, organizational or institutional impact; 4) measuring change or improvement; 5) helping one understand complex phenomena; 6) testing and evaluating new ideas and theories; 7) generating new hypotheses and theories; 8) informing multiple stakeholders; and 9) understanding past events.

An example may help here. Lindemer's (2006) study, "The Development of A Rating Scale to Measure the Quality of Preschool Literacy Environments: A Validity Study" has several components in her WHY statement. She argues that "the quality of preschool literacy instruction is crucial to children's later academic success." She also explained that, "There is a need to provide quality literacy experiences… Preschool is a vital time for literacy learning …Preschool literacy development is complex and requires knowledgeable educators in order to foster optimal literacy development," (p. 6). Lindemer gives multiple references to support her contention that it is important to look at the learning environment to improve students' learning. She does this by quoting Hallahan and Kauffman (2005), two experts in the field of early childhood literacy.

This is an example of how one researcher justified the need for her study, was able to use current literature to support her argument and was able to answer the question of why the study was needed. More specifically, in this case she demonstrated why there was a need for the development of a reliable and valid instrument to measure preschool literacy environments. Her arguments for WHY this study was needed were supported with relevant literature and was consistent with her title.

Often as one adds more justifications, material and explanations the WHY sections can grow from one or two page explanations to five or even more pages in a manuscript. In the dissertation, more than four or five pages is not necessary as typically a whole chapter will be devoted to a literature review which frequently presents the background, theory and a relevant literature related to the topic of interest. Often the reader needs the WHY summarized into a shorter statement. This is sometimes presented as the Purpose statement, but it may be identified by other authors as the Problem statement. Whichever term is used, the researcher must be consistent with its defined use, and it should not be confused with the WHAT statement, explaining what the researcher is going to do. For example, Lindemer (2006) succinctly states: "At the time of this study there were minimal or no validity estimates reported on (scales) that had good psychometric estimates (to assess preschool literacy environments." (p. 7).

This statement, along with her literature review, indicated the need and justification (the WHY) for her research. This illustrates how short a WHY statement can be. Goudy's (2005) dissertation: "Teacher Trust in Building Principals: A Contextual Relationship to School Climate in K-4 Buildings" also illustrates consistency between title and his WHY section:

> The underlying premise of this study suggests that patterns of school climate as measured by the school climate survey of the National Association of Secondary School Principals could be predicted by faculty trust in their principal as measured by the Omnibus Trust Survey. Thus, it is assumed that faculty trust in the principal would be directly related to the leadership behavior of the principal and that faculty trust in colleagues would be directly related to the open and supportive interactions

> among teachers… Trust is a critical ingredient of all human learning…[Citations of several authors given]…Although the discussion implies that climate promotes trust, it also is likely that trust facilitates the development of openness. (p. 2)
>
> Trust is an integral element of pattern-maintenance [more citations given] therefore it is reasonable to expect that those elements of school climate that are inherently expressive in character will be associated with trust [more citations given showing the link to literature]….The concept of trust allows individuals to focus on tasks at hand and to work and learn more effectively. A consequence of trust, productive relationships, builds effective schools [with more citations]." (p. 3-5).

This WHY section justifies the variables chosen to be investigated and states why the study is needed.

The "What" Section

Once the title shows the main constructs and their relationship, and the WHY section justifies the importance of the study, the WHAT section tells the reader what the researcher will do or did to carryout the study. In planning, the WHAT explains what will be done to fill the gap or solve the problem created by the WHY. In reporting, the WHAT tells what was done to address the need.

To continue with the Lindemer example, the gap that needed to be filled was the absence of valid measures of quality of pre-school literary environments. The WHAT of her study was "…to develop an evaluation scale that measures the quality of the literacy environment in preschool center-based programs…and gather validity estimates for this scale. The types of validity estimates include: content, expert judge and concurrent" (p. 6-7). It informs the reader WHAT she will be doing to address the stated need.

In our experience, the WHAT statement is frequently one paragraph, two at the most. It is more a link between the longer WHY section and the next section on RESEARCH QUESTIONS. Remember, at each transition of sections, checking for consistency means you have the ideas/concepts of a previous section aligned with the ideas in the next section. If you spend significant time justifying the concepts in the WHY section, simply listing and mentioning them in the WHAT section is sufficient to guide your reader now to the questions.

Research Questions

Research questions follow from the title, the WHY and the WHAT statements. Key words should by now be evident. Key relationships outlined in the WHY should now be reflected in the questions. The goal of data collection (the WHAT) should be clear in your questions.

Both the WHAT and RESEARCH QUESTIONS are shorter than most sections: For example, a what statement could be "This study will investigate the difference between college freshman males and females reported self-efficacy in science." That naturally lead to general research questions, "What is the reported self-efficacy of college freshman males and females in science?" Because quantitative research often is built on hypotheses these research questions could be written as non-directional hypotheses, like "There is a difference between college freshman males and females reported self-efficacy in science" or as a directional hypothesis and prediction, "Freshman college males will report a significantly higher self-efficacy in science than freshman college females."

If other variables are present in the title and are important in the WHY section then they should be part of the WHAT statements and show up in the research sub-questions. For example, if age and education variables are crucial to the research and influence self-efficacy, the research sub-question would be "Is there a difference between males and females on self-efficacy, independent of age?," "Is there a difference between males and females on self-efficacy independent of education?," etc. Once again, consistency between the Title, WHY and WHAT statements

and the Research Questions is necessary for good research. Obviously, in later sections of a dissertation, usually the chapter 3 Methods section, these questions would be turned into hypotheses, directional or non-directional, and they would generally be presented in greater detail than one would find in an introduction.

The research questions and hypotheses in Goudy's dissertation on trust would be, "Is there a relationship between teacher trust in the principal and teacher overall perceptions of school climate?" The hypothesis could then be, "There is a relationship between teacher trust in the principal and teacher overall perceptions of school climate as measured by the National Association of Secondary School Principals' (NASSP) School Climate Survey." In this case the actual name of the measurement instrument was used in the hypothesis statement but the instrument would have to be described in more detail in Chapter 3 in a dissertation or in a methods section of an article.

Figure 1 is a conceptualization of the relationship between the Title, the Purpose, Problem, and the Research Questions. It is designed to visually facilitate the understanding of how these elements are interrelated. Please keep in mind, some researchers will conceptualize the Problem as the What, while others conceptualize it as the Why. This is also true of how they define the Purpose statement. Being consistent in the use of these terms within the researcher's manuscript is crucial.

Pulling it All Together & Using A Rubric To Do So

Once the researcher completes the journey from title, to WHY, WHAT and research questions, they go back to the title to make sure the key concepts in the other sections are included. They refine the title accordingly to facilitate the logical flow. The iterative process of seeking alignment throughout the research improves the CONSISTENCY of the final project. Table 1 represents a simple rubric to help researchers in that process.

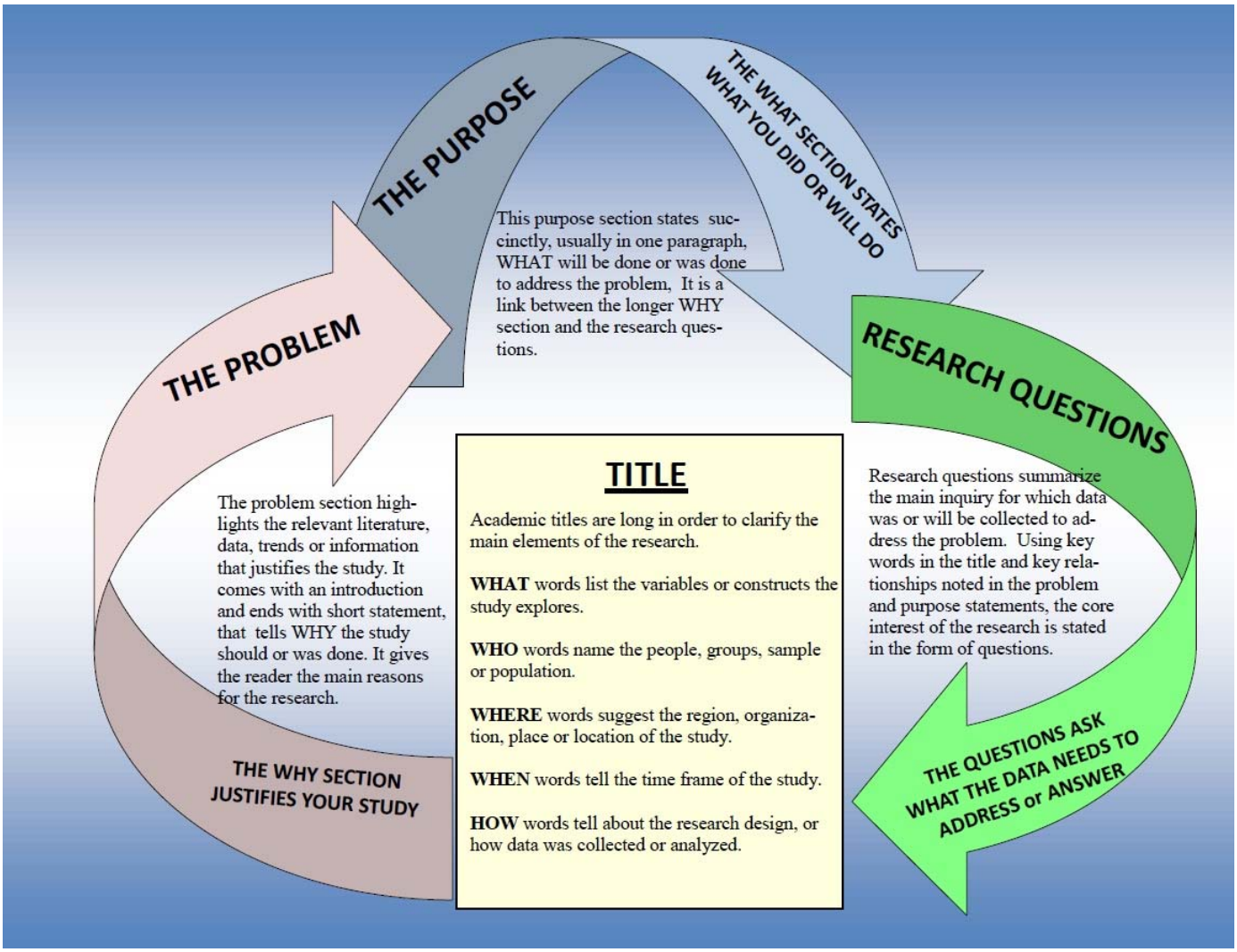
A final example from Avolio (1982) will help demonstrate the use of the rubric. Her title was good, but we will try to show how, even after its creation, improvements were possible (that is the way with most research). Her title was "Selected Aspects of Impulsivity and Their Relationship to Juvenile Delinquency".

The first thing we note is that her title is short. Frequently, dissertation titles are longer. Her WHAT words refer to the relationship between "impulsivity" and "juvenile delinquency." Since "impulsivity" and "juvenile delinquency" are attributes, they are variables that cannot generally be manipulated. Therefore, the research design is inferred to be ex post fact, with hypotheses. (The hypotheses can be inferred from the title to be "impulsivity" predicting "juvenile delinquency"). We also know a minor aspect of the HOW in that Avolio is looking for a relationship between these variables. From the title, we don't know if she believed that there was a directional relationship. We do know that because the design is ex post facto, the analysis has to be correlational, however, we don't know the type of correlations - simple correlations, multiple regression, simple path analyses, structural equation modeling, multiple discriminant analysis, canonical correlations, etc. We do know the WHO that is being studied are juvenile delinquents, but more specificity could be given on that as well. We also don't know WHEN the study was done. As such, this title could have been more informative by simply adding a colon at the end of the title with information such as: A Multiple Discriminative Analysis, and/or adding a general location and year the research was conducted.

Her WHAT statements are more precise:

> "While it is possible that delinquents as a whole are more impulsive than non-delinquent populations…it is unrealistic to assume that all delinquents are highly impulsive when compared to Non-delinquent populations….Due to past research the impact of impulsivity contribution to juvenile delinquency remains unclear [citations were given by her]. The need for research of this type is clear. If the counselor has the tools and knowledge to properly assess the person whose style of behavior is dominated by impulsivity, he is provided with valuable information in at least two ways…" (P. 3)

Figure 1. Building consistency between title, problem, purpose, and research questions.



The (WHAT) statement was…

> "This study systematically examined factors of impulsivity and their relationship to juvenile delinquency….There are many measures of the concept of impulsivity. A factor analysis of these various scales indicates they do not measure the same thing….The present study attempted to correct these methodological errors in the following manner…." (p. 2)

An example of one of the General Research Hypotheses that followed from this and was consistent with other sections was, "Knowledge of total impulsivity (Impulse control, risk taking, and delay of gratification) will account for a significant amount of variance in predicting the type of crime committed."

Her title would have been more descriptive if it indicated that she was also investigating the relationship between impulsivity and the type of crime committed by juvenile delinquents. This would add information about the WHAT of the research.

Table 1. Consistency Rubric.

Area	Best	Good	Needs Improvement
Title	Has 3-4 or more of the elements that show WHAT, WHO, WHERE, WHEN, and HOW of this study and is parsimonious. Generally has less than 25 words.	Has 3 of the elements that describe the study (What, Who and How). Or it has 3 or more elements but they are not parsimonious. Has more than 25 words.	Has only one or two of the elements of the study.
WHY (Some researchers call this section the Problem of the study and others call it the Purpose. It is important to be consistent in the use of these terms within the manuscript.	Contains clear explanation of the need and importance of the study. Shows a clear connection to relevant literature, data, trends or related information to justify the study, and create a strong argument for the research.	Contains a clear purpose of the study but with less than sufficient relevant literature, trends, or data. Able to connect relevant literature, data and information to purpose, but fails to create a strong argument for study.	Contains ambiguous purpose of study with minimal relevant literature, data or information, and lacks justification of study. The study lacks the basic argument for the proposed research.
WHAT (Some researchers call this section the Problem of the study and others call it the Purpose. It is important to be consistent in the use of these terms within the manuscript.)	Contains excellent and clearly stated plan followed (or data collection method or what the study did) to fill the gap or solve the problem.	Contains a fairly clear plan followed (or data collection method or what the study did) to fill the gap or solve the problem.	Contains a poor plan followed (or data collection method or what the study did) to fill the gap or solve the problem.
Research Questions	Contains key variables and shows relationships between the WHY and WHAT statements of the study.	Contains some variables and shows relationships between the WHY and WHAT statements of the study.	Contains some variables but does not show relationships between the WHY and WHAT statements of the study.
Overall	All the key words in the title are reflected in the WHY section, the WHAT section and the Research Questions.	Most of the key words in the title are reflected in the WHY section, the WHAT section and the Research Questions.	Few of the key words in the title are reflected in the WHY section, the WHAT section and the Research Questions.

Conclusion

Research is hard work. There is no perfect research, but building consistency into a research plan and reflecting on the alignment between the Title, Purpose, Problem and Research Questions will greatly improve the quality of the research. This article is designed to help the researcher understand the importance of consistency and it has presented a model to help one reflect on how to improve and evaluate the consistency in research. The principles and ideas presented here can also be applied to other sections of a research report to increase the likelihood that the consistency between the title and first three major sections of the research will extend to alignment with all other sections of the manuscript.

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