

Writing a Quality Empirical Journal Article
[Editorial]
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Abstract

High quality educational research studies that are clearly and accurately reported can make a significant impact on improving educational practices. The purpose of this paper is to help educational researchers report their research, particularly for publication in a journal. Each section of an empirical journal article is explained, with suggestions on how to clearly and accurately report the research that was conducted.

Introduction

The purpose of educational research is to develop new knowledge about the teaching-learning situation with the goal of improving educational practice. By collecting scientific data about important issues in education, educational research can establish the best practices that teachers, parents, counselors, administrators, and students can adopt to improve learning outcomes. Therefore, educational researchers should focus on practical research studies that can have a significant impact on improving education.

Because educational research has the potential to significantly impact the teaching-learning situation, it is essential that educational researchers complete their research projects in good faith. Poorly conducted research can cause more harm to the educational process than no research at all. For example, consider a research study that claimed to find that a certain computer educational program was effective in improving mathematics performance. As a result, considerable investment was made to provide this computer program for all learners. However, imagine that the researcher either misreported the data or fabricated the research study altogether. This means that considerable money was wasted on an educational program with questionable effectiveness. If the researcher had used honest and ethical research practices, this money would have been spent on more effective educational interventions that actually do improve mathematics performance. Under no circumstances should an educational researcher cut corners to get their research study completed faster or easier.

On the other hand, high quality research studies that are clearly and accurately reported can make a meaningful improvement in teaching and learning. For example, research into effective classroom management practices can educate teachers about how to manage student behavior to increase student learning. Research into the causes and prevention of examination malpractice can suggest solutions to overcoming this scourge in Nigerian education. Experimental studies can recommend teaching methods that improve student learning. Therefore, educational research has a powerful role to play in improving the Nigerian educational system.

To ensure that educational research is clearly and accurately reported, educational researchers have a responsibility to check, double check, and triple check their work to confirm that their methods are valid, their calculations are correct, and their conclusions accurately reflect the data that has been collected. To clearly and accurately write a quality empirical research study, particularly for submission to journals, follow the suggestions described below.

Abstract. According to the American Psychological Association (APA) Publication Manual, “An abstract is a brief, comprehensive summary of the contents of the article; it allows readers to survey the contents of an article quickly” (2010, p. 25). Therefore, it is generally best to write the abstract after the rest of the paper is complete. The following outline is useful for writing an abstract, with each point representing one sentence (Reeve, n.d.).

1. Summarize the general purpose of the study.
2. Describe the participants and perhaps what they did in the study.

3. Explain either the instrument or the treatment and control groups.
4. State the principal result from the data collected.
5. State a second important result from the data.
6. Summarize the conclusion of the study based on the paper title.

Introduction. The introduction to the research study should include a definition and theoretical explanation of the key variables in the study, as well as a summary and analysis of other research studies that have examined these key variables. In general, keep the introduction short so the main focus of the paper can be on the original empirical research that was conducted.

Purpose of Study, Research Questions, and/or Hypotheses. The purpose of the study should explicitly state the objectives of the empirical research study. Based off of these purposes, Research Questions and/or Hypotheses should be developed. Typically, Research Questions will describe one variable, whereas Hypotheses compares two or more variables.

Methods. Replication is a foundational principle in empirical research (APA, 2010). This means that another researcher should be able to replicate the methodologies used by one researcher and arrive at the exact same results. To achieve this goal, “Scientists are supposed to describe their research in detail, outlining their logic and methods of observation in such a way that other scientists may evaluate and repeat the investigation” (Singleton & Straits, 2010, p. 36). Thus, care should be taken when writing the Methods section to ensure that all procedures are clearly and accurately described exactly as they were carried out in the research study. An inaccurate or misleading description of the research methodology misrepresents the data that was collected and reflects ignorance by the researcher at best, dishonesty at worst.

In the Methods section, ensure that each sub-section reports only the information that is relevant for that section. For example, the Participants section should only report those who participated in the study, not the research design, instruments, or procedures. This helps the reader because they will know exactly what to expect in each section. Furthermore, this helps the reader know where to find relevant information if they are just skimming the work. The Methods section generally has the following sub-headers: Research Design, Participants, Instrument, and Procedures.

Research Design. The Research Design section should include three key elements. First, state and describe the research design that was chosen, which generally includes either descriptive, causal-comparative, correlational, quasi-experimental, or experimental designs. This description should be a theoretical description of the research design, including the key elements of the design as highlighted in research methodology textbooks. Second, provide a rationale for the choice of that particular research design. Finally, write a practical description of how the key elements of the research design that were just described were met in the study. For example, the key elements of an experimental design include at least one treatment group, a control group, and random assignment to treatment and control groups. Thus, the practical description of an experimental design would explain what the treatment group received, what the control group received, and exactly how random assignment was achieved.

Participants. A clear description of the individuals who participated in the study is vital to enable the reader to determine whether the results of the study can generalize to a different group of individuals. For example, through a clear description of the participants and how

they were chosen, a reader can evaluate whether the results that were found amongst a specific group of pupils in Primary 1 would apply to another group of pupils of interest to the reader. Furthermore, a clear description of the participants can help the reader make comparisons between research studies. For example, imagine that two different studies examining teachers' methods of teaching literacy found two opposite results. By analyzing the Participants section, readers can identify that one study examined teachers in a government school whereas the other study examined teachers in a private school. The different group of participants probably explains the opposing findings between the two studies.

APA states, "As a rule, describe the groups as specifically as possible, with particular emphasis on characteristics that may have bearing on interpretation of results" (2010, p. 29). Therefore, the major demographic characteristics of the sample must be described, including sex, age, race/ethnicity, level of education, socioeconomic status, and important characteristics specific to the study's topic. This means that the researcher must describe how many participants were male and female, the average age of the sample, and their level of education. Furthermore, different demographic characteristics must be explained when those variables are variables in the purposes or hypotheses or are important for the interpretation of the results. For example, if the researcher will compare nursery children to primary children, then those two groups must be explained separately. How many males and females were in the nursery sample? How many were in the primary sample? If a study is examining teachers, then it would be important for readers to know how long those teachers have been teaching because years of teaching experience likely influences the interpretation of the results.

A paragraph should also clearly explain how the participants were selected to participate in the study. Note that few, if any, educational studies actually use simple random sampling. To achieve simple random sampling, a list of every member of the population must be obtained. Then members from this population are chosen randomly. "Random" is a technical term in social science research that means that selection was made without aim, reason, or pattern (Singleton & Straits, 2010). If any study uses the word "random," it means that specific scientific procedures developed by scientists were used to ensure that the sample was selected purely by chance, such as the hat-and-draw method or a random number table.

Instrument. The purpose of the Instruments section is to give readers a detailed explanation of how the key variables in the Research Questions and/or Hypotheses were conceptualized and measured in the study. Clearly and completely describing the instruments used in the study is important so that the reader can evaluate the study's conclusions by determining whether the instruments adequately measured the variables of interest. Furthermore, like the Participants section, a description of the instrument enables researchers to make comparisons to other research findings.

The Instrument section should start with a general overview of the instrument(s) used: the type of instrument (e.g., self-report questionnaire, achievement test scores, interview, behavioral checklist) and the general format of the instrument (e.g., Part A for personal information, and Parts B, C, D for the key variables). After a brief introduction, the Instrument section should separately explain how each variable was measured, which generally requires one paragraph per variable. Sometimes, it is helpful to label the paragraph with the name of the variable focused on in that paragraph. Each variable should contain the following: a brief definition of the variable, how many items measured the variable, how

participants responded to the items (eg., Strongly Agree), a sample item, and how a score was calculated for the variable.

Procedures. The purpose of the Procedures section is to outline when, how, where, and for how long the research study took place. If a questionnaire or interview was administered, report who administered the questionnaire, where the questionnaire was administered, when the questionnaire was administered, how long participants had to complete the questionnaire, and what directions were given to the participants.

In experimental designs, it is important to provide a clear description of both the treatment and control groups. Each treatment or control group requires at least one paragraph of explanation. Include the overall goal of the treatment, how long the treatment lasted, how often the participants met for the treatment, how long each meeting lasted, the general format for each meeting, the methods used, and so on.

Results. The Results section should be structured around the research questions and/or hypotheses that were listed at the beginning of the paper. The Results section will answer each research question and/or hypothesis one by one, in the order that they were listed. First repeat the research question/hypothesis. Then explain the data that was used to answer the research question/hypothesis from the instrument. For example, what item(s) on the questionnaire were used to answer the question? Next, justify and explain the statistic that was used to answer the research question/hypothesis. The reader should have a clear understanding of all of the numbers that are presented as well as how those numbers were calculated based on the data collected from the instrument. Then present the statistics, typically in a table or figure. Finally, interpret the statistics. For hypotheses, explain whether the statistic was significant, and if so, explain what the significant result meant. For example, if a significant difference was found between males and females, then explain which group was higher on the dependent variable of interest by examining the mean scores. However, if there was no significant difference between males and females, then no discussion of the mean scores is necessary because any difference in the mean scores is not large enough to be significant.

It is important to keep in mind that everything in the Results section should be clearly written for the reader's convenience. For example, some researchers are tempted to write, "Respondents generally agreed to Items 1, 4, and 7." However, the reader does not know what these items mean. Therefore, the researcher must describe the content of the items. For example, "Respondents generally agreed that they valued education, wanted to continue their education, and were interested in additional educational opportunities."

Discussion. The purpose of the Discussion is to highlight the major findings from the Results and interpret them. First, restate the overall purpose of the study. Then explain the most interesting finding from the study. Next, summarize the results by explaining how the statistical findings from the Results section relate to the purpose of the study. One way to do this is to take every research question or hypothesis and explain in plain terms what the statistical results meant and how the results are related to education in general. All points must be supported by statistics calculated in the results. However, numbers should not be repeated in the Discussion section; instead explain the key finding from the statistics. Try also to integrate the findings into the results of other research studies.

Recommendations. The Recommendations should consist of practical steps that educators can take to improve education based on the results of the study. It is very important to keep in mind that these recommendations must be supported by the statistical findings from the results. A common mistake is to make recommendations that are completely unrelated to the results of the study. For example, an author who examined teacher motivation may make recommendations about student motivation, which is beyond the scope of the study and thus is unacceptable. Likewise, another common mistake is to make a recommendation that contradicts the findings of the study. For example, if a study found that most teachers already have positive motivation toward teaching, then a recommendation cannot be that administration should improve teachers' motivation toward teaching.

Conclusion. The final section of the paper is the Conclusion section. Briefly summarize the overall conclusion of the research study and its importance to educational practice. Again, the conclusion must be directly related to the results of the study. One strategy for writing the conclusion is to refer back to the paper title and explain how the results relate to the title.

Avoid Plagiarism. Plagiarism means using another person's ideas, results, or words without proper credit. This means that in a journal article, every sentence in a paper, except those in quotation marks, is expected to be in the original words of the author. Copying words from another source without quoting, as well as copying ideas from another source without citing, is illegal, unethical, and unacceptable. Furthermore, the concept of plagiarism extends to ideas. If a study was modeled after a different study, or if an instrument was adopted or adapted from another existing instrument, then the author must cite where these ideas came from.

In conclusion, educational research is a valuable and exciting endeavor. Conducting educational research takes considerable time, preparation, and precision in developing and describing the research methods and results. However, the benefits of a quality educational research study can have wide-ranging implications in improving the quality of education for both learners and teachers.

References

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