The Quantitative Research Plan Template

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Formatting and APA Pointers

General Pointers

- As per APA (see p. 69), use of first person rather than third person throughout the manuscript. This improves word economy and also helps reduce the use of passive language (see APA pp. 77 – 78).
- As per APA, when reviewing specific literature, always use past tense. If discussing the general state of the literature, use present.
- As per APA, references should be ordered alphabetically by first author.
- All direct quotes must be followed with a page number.
- As per APA use (a), (b), and (c) rather than (1), (2), and (3)
- Every paragraph in your manuscript should have a clear topic sentence, supporting sentences, and a concluding sentence.
- Use direct quotes selectively and sparingly. Use and cite the literature to develop your argument, but try to keep your own "voice."
- Find primary sources rather than citing secondary sources. Your research will appear more credible if you rely on primary sources rather than relying on another researcher's interpretation of the primary source. It is comparable to the telephone game. The more the message travels, the more distorted it gets from the original. It is always best to go to the original source.
- Check for alignment throughout.

Title

Full Legal Name

University Name

ABSTRACT

Begin the abstract here, justify left with no indentation, double space. Example excerpt of an abstract: This study examined the impact of both high school setting (e.g., public, private, Christian, or home school) and textbooks (e.g., secular, Christian, or a combination of both) on the demonstrated critical thinking skills of first-semester college freshmen. Students at two universities completed the Watson-Glaser Critical Thinking Appraisal and a short demographic survey which included information about the students' gender, high school GPA, SAT and ACT scores, type of high school attended, and type of textbooks used. Mean test scores fell within the 50th percentile. No significant differences were found for the overall Watson-Glaser Critical Thinking Appraisal based on the type of high school attended or the type of textbooks used. However, significant differences were noted for two of the Appraisal's subtests. In addition, significant correlations were found between variables such as gender, SAT score, GPA, and performance on various sections of the assessment. Results indicate that the types of high schools attended by this study's population are doing an adequate, but not outstanding, job of developing students' critical thinking skills. Suggestions for further research are also included.

Introduction

The introduction section provides a brief overview of the problem that the research study is addressing and the general purpose of the research study. It includes an overview of the chapter contents.

Review of the Literature

The review of the literature usually begins by providing the most relevant literature that provides the historical (e.g. how the problem has evolved over time) and social (e.g. contexts), context and relevance of the study. Questions that may be asked or addressed may include but are not limited to: What is the problem and why is it an interest? Who else is affected by the problem? What research has been done to investigate or address the problem? How will the proposed research extend or refine the existing knowledge in the area under study? Who will benefit or use the proposed research? So what? Who cares?

However, the overall purpose of literature review is to provide a tight synthesis (not simply a study-by-study summary) of the existing knowledge on this topic and link this existing knowledge to the proposed study. Remember that the literature review is the argument for the significance of the study. It communicates what has been examined on the topic(s), what has not been examined or how understanding on the topic is still developing, and how the study can fill the gap or further understanding in the field.

Identification and description of the conceptual or theoretical framework (e.g., theories, principles, generalizations, and research findings that are closely related to the present study) should also be included. The theoretical or conceptual framework section should provide the reader with a direct connection to the conceptual or theoretical framework that will effectively guide the study and allow the findings to be situated within a greater context. According to

Maxwell (2005), "the point is not to *summarize* what has already been done in the field. Instead, it is to ground your proposed study in the relevant previous work, and to give the reader a clear sense of your theoretical approach to the phenomena that you propose to study" (p. 123). Start by describing the theory(ies), including origination and major theorist(s), next discuss how the theory(ies) has been validated and advanced or informed the literature on your topic, conclude by articulating how your specific research focus relates to the theory and how it may potentially advance or extend the theory(ies). Examples of theoretical frameworks include Bandura's (1986) Social Cognitive Theory, Maslow's (1954) Hierarchy of Needs, Knowles (1980) Adult Learning Theory, etc. Situating the study and research questions within an established theoretical framework helps establish the significance of the study.

For quantitative research, it is especially important to explain how the theoretical framework guides the identification of the variables and provides an overarching explanation for how and why one would expect one variable to explain or predict another variable, informing the research questions and hypotheses, needs to be included. Also, how theory is being tested needs to be clearly explained and demonstrated. Filling in Creswell's (2007) script may help:

- The theory, who used it, and it applicability.
    - The theory I will use is_____ (theory name)
    - It was developed by _____ (origin, source, developer of the theory), and it was used to study ____ (topic where one finds the theory applies).
- Central hypothesis.
    - The theory indicates that_____ (identify propositions or hypotheses).
- Adaption of the theory to study.

- As applied to my study, this theory holds that I would expect my independent variable(s)_____ to influence or explain my dependent variables_____ because _____ (provide rationale based on the logic of the theory).

The literature review should end with a focused summary of what is currently known, what is not known, and how the study can specifically address gaps in the existing literature. Subheading at level 2 and 3 are often necessary. Often 1,000 – 2,000 articles are read and at least 100 – 200 integrated in the construction of this chapter. The majority of the literature cited in the literature review needs to be current (i.e., < 3 - 5 years since publication).

It is important to remember that chapter two is not a library, that is, a summary of facts or summaries of relevant research, rather a critical argument. Derived from Rudestam and Newtons' (2007) *Surviving Your Dissertation*, here are some keys to a successful construction of a literature review:

#1 Be a convincing writer. Remember that your literature review provides the context for your dissertation and demonstrates why your topic is important and relevant. Your literature review demonstrates the relationship between previous research and your study, and it demonstrates how your study is distinctive and different from previous research.

#2 Be a critic not a reporter. Adopt a critical perspective in reading and identifying relationship among research articles. Avoid composing a literature review that is a library of facts. That is, make sure your literature review is a coherent argument that leads to the problem statement or description of the study you are proposing. Your literature review should begin with a clear statement of your goal and be followed by a structured argument.

#3 Be a selective writer. Avoid the temptation to report all of your great knowledge and insight--- all the literature you review. Be selective and discuss only the articles that are most relevant. Keep in mind that you may review 1,000- 2,000 articles and only include about 200.

#4 Be a skillful researcher. Use primarily seminal articles and articles that are no more than 5 years old in your literature review. Always strive to cite primary sources and reputable and scholarly sources.

#5 Be a reasonable problem solver. At the conclusion of your literature review, write a statement that summarizes or highlights the most relevant literature and conclusions that lead to your proposed study. Be sure that you clearly identify that your problem has both theoretical (i.e. fills a gap in the literature) and practical value (i.e. solution to a problem or concern in the professional field, improves professional practice.).

Problem Statement

"A problem might be defined as the issue that exists in the literature, theory, or practice that leads to a need for the study" (Creswell, 1994, p. 50). A problem statement summarizes "the context for the study" and the main problem the study seeks to address (Wiersma, 1995, p. 404). It usually identifies the general problem, the specific problem, the focus of the research, and the population sample. The problem statement draws from the background section; it includes current (i.e., < 3 - 5 years since publication) literature (3 - 5 citations) to show that the proposed research is empirically significant and relevant to the field. It should be stated clearly and unambiguously in one to two paragraphs. The candidate may state: "The problem is . . . "

Purpose Statement

The purpose statement should follow the problem statement and clearly and succinctly state the focus and intentions of the proposed research. "The purpose statement should provide a specific and accurate synopsis of the overall purpose of the study" (Locke, Spirduso, & Silverman, 1987, p. 5). At minimum, the statement includes the research method (i.e., Qualitative, Quantitative or Mixed); the research design(s), the variables, a brief definition of the variables, identification of the variables (i.e., Independent, Dependent, Variable of Interest, Covariate), and the specific population. The candidate is encouraged to use the following template generated by Creswell (1994, 2003) as a guide for writing the purpose statement: The purpose of this _____ (true experimental? Causal comparative? Correlational? Pretest-postest control group?) study is to test the theory of _____that _____ (compares? relates?) the _____ (independent variable, variable of interest) to _____ (dependent variable), controlling for _____ (control variables) for _____ (participants) at _____ (the research site). The independent variable(s)/ one of the variables of interest _____ will be generally defined as _____ (provide a general definition). The dependent variable(s)/ other variable of interest will be generally defined as _____ (provide a general definition), and the control and intervening variables(s), _____ (identify the control and intervening variables) will be statistically controlled in this study. The statement usually begins with "The purpose of this study is. . ." It foreshadows the research question(s) and hypothesis (es).

Although brief in nature, the problem and purpose statements are two very important aspects of the manuscript. These statements support the importance of the study and identify the goal of the research. All preceding writing within the manuscript should funnel into the problem and purpose statements. All proceeding aspects of the manuscript support and further expand upon the problem and purpose statements. The candidate needs to ensure that there is a clear relationship among the problem statement, the purpose statement, the background and literature, and the research.

Example Problem and Purpose Statement:

"Computer Mediated Communication (CMC) systems are central in the delivery of online education. Research has demonstrated that asynchronous technologies promote reflection and learning, and research is beginning to demonstrate that synchronous technologies may enhance the asynchronous e-learning environment by decreasing feelings of isolation and better supporting learners' sense of community. Researchers have also cited limitations of synchronous technologies, such as technical and scheduling problems, that have the potential to detract from the asynchronous e-learning environment. Improved understanding is needed regarding if and how synchronous systems, especially audio and visual technologies, can enhance or detract from the quality of the traditional asynchronous e-learning environment. The purpose of this study is to contribute to this understanding by examining how the use of synchronous CMC systems, as a complement to asynchronous CMC systems, influence learners' social presence, cognitive presence, teacher presence, and perceived learning measure in the e-learning environment. This understanding will assist educators in identifying practices for quality online teaching and learning (Argaugh et al., 2008, Garrison & Kanuka, 2004) and provide higher education administrators with conceptually grounded research to guide decisions about technology

adoption, specifically adoption on CMC systems, to enhance the quality of their online programs and courses." (Szapkiw, 2009)

Significance of the Study

The significance of the study section may be included in the purpose statement or be contained in its own section. It contains a description of the contributions that the study makes to the knowledge base or discipline, both theoretically, and empirically (e.g. How does it relate to other studies that are similar or that investigate the same issue?)

This section also includes a brief description of how the study is important the location, organization, general population, or sample being studied (e.g. Why and how does it affect them? How will it improve the conditions, lives, work environment, etc.? How can this study be used on a wider scale to affect change to help a wider group of people or the organization as a whole?). References are very important here to lend additional credence and support the study. All assertions in this section need to be well supported by the literature. Citations are needed.

Research Question(s)

The proposed research questions need to be derived from the problem and purpose statements. A well-formulated research question does the following: (a) asks about the relationship between two or more variables, (b) is stated clearly and in the form of a question, (c) is testable (i.e., possible to collect data to answer the question), (d) does not pose an ethical or moral problem for implementation, (e) is specific and restricted in scope (i.e., The aim is not to solve the world's problems), and (f) identify exactly what is to be solved. A good research question also clearly identifies the sample population. In addition, it should be noted that the research question implies the research design and statistical analysis. A typical dissertation

contains two to five research questions. Research questions should be listed, each on a separate line.

Example: The research questions for this study are**:**

"RQ1: Is there a difference between students' social presence, cognitive presence, and teacher presence who use only asynchronous CMC systems and who use a combination of both asynchronous and synchronous CMC systems?

RQ2: Is there a difference between students' learning who use only asynchronous CMC systems and who use a combination of both asynchronous and synchronous CMC systems?" (Szapkiw, 2009)

Hypothesis or Hypotheses

Following each research question, the null hypothesis (es) (H_0) and the alternative hypothesis (es) (H_1 or H_A) need to be stated. These hypotheses need to be written with words, not symbols. Every research question should have at least one corresponding alternative and null hypothesis; however, sometimes more than one is needed. The number of hypotheses needed should be based upon the number of variables under study and planned analysis. Well-formulated hypotheses are based on the following criteria: (a) the hypothesis stated the expected relationship between variables, (b) the hypothesis is testable, (c) the hypothesis is stated simply and concisely as possible, and (d) the hypothesis is founded in the problem statement and supported by research (Bartos, 1992). Like the research questions, the hypotheses in null form directly influence the statistical procedures used.

Example: The following are the research hypotheses:

"H_1: Online students who utilize a combination of synchronous and asynchronous CMC systems for instruction and discussion as opposed to online students who utilize only an asynchronous CMC systems for instruction and discussion will have statistically significant differ in terms of the combination of social presence, cognitive presence, teaching presence.

H_2: Online students who utilize a combination of synchronous and asynchronous CMC systems for instruction and discussion as opposed to online students who utilize only an asynchronous CMC systems for instruction and discussion will have statistically significant different levels of social presence as measured by the COI Framework survey (Arbaugh et al., 2008).

H_3: Online students who utilize a combination of synchronous and asynchronous CMC systems for instruction and discussion as opposed to online students who utilize only an asynchronous CMC system for instruction and discussion will have a statistically significant different level of cognitive presence as measured by the COI Framework survey (Arbaugh et al.).

H_4: Online students who utilize a combination of synchronous and asynchronous CMC systems for instruction and discussion as opposed to online students who utilize only an asynchronous CMC system for instruction and discussion will have a statistically significant different level of teacher presence as measured by the COI Framework survey (Arbaugh et al.)

Alternatively, the following are the null hypotheses:

H_{o1}: Online students who utilize a combination of synchronous and asynchronous CMC systems for instruction and discussion as opposed to online students who utilize only an asynchronous CMC systems for instruction and discussion will have no statistically significant

difference in terms of the combination of social presence, cognitive presence, teaching presence, and learning outcomes.

H_{o2}: Online students who utilize a combination of synchronous and asynchronous CMC systems for instruction and discussion as opposed to online students who utilize only an asynchronous CMC systems for instruction and discussion will have no statistically significant difference in their level of social presence as measured by COI Framework survey (Arbaugh et al., 2008).

H_{o3}: Online students who utilize a combination of synchronous and asynchronous CMC systems for instruction and discussion as opposed to online students who utilize only an asynchronous CMC system for instruction and discussion will have no statistically significant difference in their level of cognitive presence as measured by the COI Framework survey (Arbaugh et al., 2008).

H_{o4}: Online students who utilize a combination of synchronous and asynchronous CMC systems for instruction and discussion as opposed to online students who utilize only an asynchronous CMC system for instruction and discussion will have no statistically significant difference in their level of teacher presence as measured by the COI Framework survey (Arbaugh et al., 2008)." (Szapkiw, 2009)

Identification of Variables

Key variables used in the research need to be identified; this is essential for external validity. Each variable needs to be listed, labeled (e.g., independent, dependent), and operationally defined. All definitions in this section need to be supported by the literature. Citations are needed. A dictionary definition is not appropriate.

Example: "The predictor variables in this study will be four factors of cultural intelligence. Cultural intelligence is "an individual's capability to function and manage effectively in culturally diverse settings…a multidimensional construct targeted at situations involving cross-cultural interactions arising from differences in race, ethnicity, and nationality" (Ang, et al., 2007, p. 336; Earley & Ang, 2003). Cultural intelligence is comprised of the following four factors: metacognitive cultural intelligence, cognitive cultural intelligence, motivational cultural intelligence, and behavioral cultural intelligence. The Cultural Intelligence Scale (CQS) Ang et al. (2004) will be used to measure these four factors of cultural intelligence. The CQS uses 20 items that describe individuals' capabilities to be culturally intelligent in each of the four factors and asks the individuals to use a scale from one to seven to assess their agreement with the statements." (Kueng, 2011, p.12) The four factors are then defined.

Design

In the design section, the methodology and research design(s) is identified. The research design specified needs to be specific. For example, it is not sufficient to state that a quasi-experimental study was conducted. It would be more appropriate to state that a pretest- posttest non-equivalent control group design was conducted. In addition to identifying the design, a rationale for why the design is most appropriate for the study is needed. This rationale needs to be supported by research text as well as topic specific, peer-reviewed literature. In other words, what is the purpose of the design? When is it used? Why is it the most appropriate choice for the present study? Refer to educational research texts for the proper design description and use them to support your rationales. The chosen research design(s) should be consistent with the research question and hypothesis proposed as well as the procedures described. Sometimes more than one research design is appropriate.

Example*:* **"**A causal comparative research design will be used to determine if students' social presence (SP), cognitive presence (CP), teaching presence (TP), and perceived learning differed based upon the type of CMC system used in the online courses. This research design was chosen because it attempts to explore possible causative relationship between an independent variable and a dependent variable on an occasion in which the researcher is unable to control the independent variable. Since the randomization is not possible in a causal-comparative study, the control procedure of comparing homogeneous groups based on collected demographic data will be is adopted to help achieve equality of groups (Gall, Gall, & Borg, 2010)."

Another example: A quasi-experimental non-equivalent group research design will be used for the study. Two instructors will each teach two classes, one in the morning and one in the afternoon. The assignment of the effort condition will be random by class, so that the two levels of the condition for the book and chapter will be counterbalanced for teacher and time of day. Each instructor will give a high effort assignment to one class for the book and a low effort assignment for the book to the other class. The opposite assignments will be given to each class for the chapter. The second independent variable, high praise or no praise feedback will be administered randomly by student in each of the effort conditions.

Assumptions and Limitations

Assumptions

Present a clear statement of each of your assumptions relative to the sampling frame, the research design and other pertinent aspects of the study (e.g. all raters will receive intensive training and rate behaviors similarly). This will be moved to chapter 5 for the final manuscript.

Limitations

Describe the weaknesses to the study that cannot be controlled. Think about weaknesses of the study, the design (e.g., lack of randomization, bias), the analysis, the instruments, and the sample (e.g. gender, age, ethnicity, geographical location). Limitations should be discussed in terms of threats to both internal and external validity. Identify the type of threat and describe it in terms of the present study. Discuss how the limitation could potentially impact the study, and discuss if any steps will be taken to limit the threat.

Example: "Results do not account for students at universities who chose not to participate due to multi-institutional research polices that prohibited participation or universities or who chose not to participate for other reasons. Since this study used survey data, responses made by students who did not respond to the survey or who dropped out of the online courses were not accounted for. This subjected the study to unit nonresponse and the issue of non-ignorable nonresponse. Within the realm of non-ignorable non response issues, item nonresponse was not a problem in this study; however, the problem of unit nonresponse needs to be noted as a limitation when applying and making inferences based on part one of this study (King, Honaker, Joseph, & Shever, 1998). Since the data analysis did not use statistical controls to address the issue of non-ignorable nonresponse, findings cannot be applied to the students who did not respond. Thus, care should be taken not to make invalid inferences based on the results (Hausman & Wise, 1979)."

Participants

In the participant section, the population, the sample size, the type of sample (e.g., a purposeful, criterion, theoretical, etc.), the sampling procedures (e.g., convenience sampling, snowball sampling, etc.), and the sample characteristics should be explained. This includes an in-depth discussion of how the sample was identified from the population, who selected the

sample, and how the study was introduced to the sample, including gaining participation. In other words, the sample selection procedures (who, what, when, where, how) need to be explained in enough detail for the study to be replicated. Further, the actual sample size and the needed sample size for the chosen research design and analysis need to be specified. A rationale and support through quantitative literature citations should be provided for the adequate sample size (e.g., 64 per group), type of sample (e.g., purposeful, theoretical, etc.) and sampling method (e.g., convenience, snowball, maximum variation, etc.) for your specific research design and analysis chosen. Participants of the study are also described in detail. This includes demographic information (age, ethnicity, gender, etc.) described in narrative or tabular form.

Setting

In the setting section, the setting of the study is described (e.g., testing location, school system, specific course or program for the treatment and control groups, etc.). Real names for people, schools, and school districts should never be used. Use pseudonyms for people and descriptors when necessary. The setting, especially the treatment setting needs to be described in sufficient details so that the study could be replicated.

Example: *"*Accredited undergraduate- and graduate-level online helping profession courses were will be used in this study. All the courses will be offered by regionally accredited institutions and taught by experienced online educators. The courses will be delivered in the Spring 2009 term and will be between 8 and 16 weeks in length. Students will earn three semester hours of college credit for each course. Courses were delivered fully online using either a completely asynchronous format or a combination of asynchronous and synchronous format. Asynchronous only courses will be delivered via the Internet using a content management system (CMS) or a learning management system (LMS). Courses will not be limited to a particular courseware

platform. All systems will consist of an integrated set of tools for delivering course content, communicating with learners, and displaying grades. With the CMSs and LMSs, students can create personalized homepages, accessed and retrieved content (e.g. audio narrated PowerPoints, syllabus, assignments, weblinks, etc), submitted assignments, retrieved grades, and completed quizzes and exams. The electronic asynchronous communication supports used for course discussion and collaboration will include e-mail, message boards, announcements, wikis, blogs, and discussion forums. In the synchronous and asynchronous combination courses, learning will occur via the Internet using two mediums: (a) CMSs or LMSs and (b) e-conferencing systems. Similar to the asynchronous courses, the courses will not be limited to a particular courseware platform; Angel, and Blackboard ™, and university-created sites were used. The CMSs and LMSs will be used by students for the same purposes in the synchronous and asynchronous combination courses as they were in the asynchronous only courses: creation of personalized home pages, access and retrieval of content (e.g. audio narrated PowerPoints, syllabus, assignments, weblinks, etc) and grades, submission of assignments, and completion of quizzes and exams. Communication and collaboration will be done using e-mail lists, message boards, wikis, blogs, and discussion forums. E-conferencing systems also allowed for communication and collaboration. The courses will be not limited to any particular e-conferencing system; Adobe® Acrobat® Connect™, Wimba, Skype™, and Microsoft Live! were used. Using the collaborative conferencing software, students--both with the instructor and independent of the instructor--in remote geographical locations participated in class and small group discussions, will work collaboratively on course assignments, study for exams and quizzes, socialized, present for class presentations, listen to lectures, and watch class demonstrations. The real-time audio chat features of the e-conferencing system will be used in all courses; additional features

used in some of the courses will include text chat, shared whiteboards, application sharing, polling, video, and recording and archiving. Students will use the e-conferencing systems both with and independent of their instructors."

Instrumentation

In the instrumentation section, the instrument(s) that are used to measure each variable needs to be identified. The instruments may be tests, surveys, questionnaires, observational protocols, or other measurements. It is highly recommended that only validated instruments be used. A description of each instrument, its content, its origin, and its appropriateness needs to be included. If applicable, scoring information for the composite and subscales needs to be included (e.g. range of possible score and interpretation of scores) as well as validity information and reliability statistics. The validity and reliability information should be cited. In some cases, reliability statistics need to be reported for the data in the present study. If there is a case where an instrument is created for the purpose of the study, the procedures followed for development, reliability information, and validity information needs to be provided. The protocol used for developing the instrument should be informed by the research and procedures followed should be cited.

Example: "The MLQ 5X is the most widely accepted instrument used to assess transformational leadership (Bass & Riggio, 2006) and will be used to measure leadership effectiveness in the present study. In addition to transformational leadership, the MLQ 5X also measures transactional and laissez-faire leadership or the full range of leadership model. Transformational leadership is composed of five factors: (a) idealized influence (attributed); (b) idealized influence (behavior); (c) inspirational motivation; (d) intellectual stimulation; and (e) individualized consideration (Bass & Bass, 2008; Bass & Riggio 2006). Transactional leadership

is comprised of the following three factors: a) contingent reward leadership, (b) management-by-exception active, and (c) management-by-exception passive (Bass & Avolio, 2004; Bass & Riggio, 2006). The last factor of laissez-faire leadership represents an absence of any type of leadership. The MLQ 5x uses four descriptive statements to assess each of the nine factors for a total of 36 items. The MLQ 5X also includes nine items that measure outcomes such as leader's effectiveness, satisfaction with the leader, and extra effort of followers. However, these were not included in this survey in order to lower the total number of questions in the online survey. Reliability coefficients for the MLQ 5X scales range from 0.74 to 0.94 (Bass & Avolio, 2004). For the present study, Cronbachs alpha for the subscales range from from 0.70 to 0.85.

Each statement on the instrument describes a behavior associated with a leadership style and asks the individual to assess the frequency of their use of that behavior. A 5-point Likert scale is used in which zero denotes "not at all" and a response of four means "frequently, if not always". There are four items for each factor of leadership. A separate score is derived for each factor of leadership by summing the item scores and dividing by four. The higher the score on the statement, the higher the level of a particular factor for transformational, transactional, or laissez-faire leadership. The minimum score for each factor is 0 and the maximum score is 4. These five scores for each transformational leadership factor are then added for a total transformational leadership score. The minimum transformational leadership score is 0 and the maximum score is 20." (Keung, 2011)

Procedures

In the procedures section, the details necessary to replicate the study are outlined. This includes but is not limited to information about securing IRB approval, eliciting participants for the study, conducting a pilot study, training individuals to implement treatment, administration

of the procedures, gathering the data, and recording procedures. The procedures should be described in a chronological, step-by-step format. All procedural material (e.g., protocol, training manual) should be included in an appendix.

Example: "After submitting an IRB packet and gaining approval, the researcher will execute the research. Two to three weeks prior to the end of the course, students will receive an e-mail from the researcher forwarded by their course instructor. The letter will inform students about the study and the availability of the online instrument. The letter requested that the students complete the voluntary, anonymous web-based survey within a two- to three-week period (see Appendix). Having participants complete the instrument two to three weeks prior to the completion of the course will allow students sufficient experience in the course and sufficient use of the technologies. This timeframe will also ensure that participants have a reasonable amount of time to access the instrument. One follow-up e-mail will be sent as a reminder (see Appendix). No monetary incentive will be offered to complete the online survey; however, some instructors may offer a few points of extra credit to complete the survey. All of the instructors will mention to students the importance of the study for improving online learning and the benefits of participating in research. Using the web-based survey format and requesting that faculty or program personnel e-mail students participating in the online courses, protected institutions from liability (e.g. Family Educational Rights and Privacy Act) and protected students' privacy. Furthermore, the anonymity of the web-based survey may eliminate apprehension. Student participants may have been more honest and felt safer disclosing their feelings or opinions from the comfort and privacy of their homes, thus reducing the threats introduced by self-report measures such as the potential bias resulting from dishonest reporting (Granello & Wheaton, 2004; Van Selm & Jankowski, 2006)." (Szapkiw, 2009)

Data Analysis

In the data analysis section, the type of data analysis is identified and a concise rationale for the type of analysis is provided. The chosen statistical procedures should be consistent with the research questions, hypotheses, and type of data collected (as outlined in chapter one and three). In other words, why is the chosen analysis the most appropriate choice to test the hypothesis? The rationale needs to be supported via analysis literature. For each identified analysis, all assumption tests and how they were tested, the statistic used to report the effect size and the convention used to interpret it, and the alpha used needs to be discussed. In this section, there needs to be an identified statistical procedures for each hypothesis Thus, it is useful to organize this section according to the research hypotheses.

Example*:* A one-way multivariate analysis of variance (MANOVA) was used to analyze the hypothesis, there will be a statistically significant difference between the linear combination of motivation scores for group A and group B. A MANOVA will be used to analyze the data because a MANOVA takes into consideration the correlation among the dependent variables while controlling for the overall alpha level (Tabachnick & Fidell, 2007). Various conventions exist to determine the number of participants per cell to conduct a MANOVA. Suggestions about the optimal participants range from the minimum of 20 participants per group to six to ten times the number of dependent variables (Swanson & Holton, 2005). At minimum, the number of participants per group must exceed the number of dependent variables (Swanson & Holton, 2005). A power analysis revealed that at least 64 participants per group is needed. For this study, the number of participants per group will exceed 64. A $p < .05$ level of significance will be used for all analyses in the study to determine if the null hypotheses can be rejected. The effect size will be calculated using the Eta squared statistic and interpreted based on Cohen's *d* (1988).

Preliminary analyses to examine the assumptions of no extreme outliers, normality, linearity, singularity, and multicollinearity were also conducted. The assumption of no extreme outliers will be examined using boxplots.…

References

All the references cited within the text should be listed in accordance with the most recent edition of the *Publication Manual of APA*. The reference title should capitalized and centered.