

Ch. 1: For starters, why is educational research important? With what kind(s) of educational research (Table 1.2) are you familiar? How have you seen educational research used in practice?

Educational research is important because it allows professionals to find published research articles about one's occupational field, read and learn from those articles, and provide examples on how to conduct one's own research (Johnson & Christensen, 2012). By staying up to date on the latest research, educators can be efficient and effective in their classrooms. We understand our students better because of the research that has been conducted; therefore, we can meet the needs of our students and teach according to their learning styles.

I am most familiar with basic and applied research as well as evaluation research. During this past year, I participated in evaluation research when my school started a program called "Schools of Hope." I volunteered to act as a trial classroom for the first year of implementation. We frequently met to discuss what was working and what was not, as well as how those areas could be improved. We looked at student test scores after each period to judge whether or not the program was impacting student growth. I have also read basic and applied research about the impact of using technology with students and how it greatly increases motivation and achievement in the classroom.

Ch. 2 What are one or two interesting observations about the differences between quantitative, mixed, and qualitative research that are outlined in Table 2.1?

I agree with Carolyn that quantitative and qualitative researches seem to be opposites of each other. When reviewing Table 2.1, I have to wonder how you can just do one or the other. To me, it seems like the only way to get complete and accurate results is to do mixed research, similar to Rachel's observation. I think you have to have a little bit of both (quantitative and qualitative) to get just the right reading (mixed).

For example, if one was looking at the nature of observation, under quantitative research behavior is only studied under controlled conditions so the researcher can isolate the effects of single variables. This is great because the observer can pinpoint the exact variable that changed behavior. However, is it reliable since it wasn't in a natural setting? On the other hand, qualitative research studies people in their natural settings to understand the deeper meaning behind their actions. Now one can see how the individuals interact normally, but can you pull out the variable in a random setting? Mixed research seems to provide the perfect solution since you would "study multiple context, perspectives, and conditions [and] study multiple factors as they operate together" (Johnson & Christensen, 2012, p. 34). Thus, getting the best of both qualitative and quantitative.

Ch. 6 Why is it difficult to measure psychological or educational constructs? How would you recommend measuring each of the following: the intelligence of an individual entering kindergarten, the amount of time it takes someone to run the 40-yard dash, someone's self-esteem, and someone's race? How would you measure a students' giftedness?

It is difficult to measure psychological or educational constructs because of the number of variables involved. A researcher must take into consideration the current situation, personality characteristics of the person, background knowledge or exposure, environment, as well as academic achievement when conducting a psychological or educational study. This is why it is important to use multiple tests when gathering information or evidence. A researcher needs to make sure their evidence is reliable *and* valid.

In order to measure the intelligence of an individual entering kindergarten, I would recommend using a preschool assessment test, using a nominal measurement scale, such as the Early Screening Profile to determine their current developmental ability. To measure the amount of time it takes someone to run the 40-yard dash, I suggest using a ratio scale. Since you are dealing with time, it has a true zero point. Someone's self-esteem and race would also need to be measured using a nominal scale since a type cannot be quantified. A personality test of the self-report variety may be given to judge the level of self-esteem one has. A student's giftedness may be measured using an intelligence test along with performance measures to determine IQ level. An interval scale will be used to measure this type of information or knowledge.

Ch. 8 Choose an educational research topic of interest to you (other than one mentioned in the course materials for this chapter). Describe two methods of data collection that could be used to provide the best data for your particular topic.

I am fascinated with using technology in the classroom. Therefore, my educational research topic of interest to me would be, "What impact does using technology in the classroom have on student achievement scores?" Two methods of data collection that could be used to provide the best data would be tests and observations. First of all, standardized tests would need to be used to provide reliable and valid data for student achievement scores. It would also allow for scores to be accurately compared before and after the study is completed. I would choose to focus on one particular subject, such as mathematics, in order to get the most accurate results. This way, I can test students on mathematical concepts taught with and without using technology. Secondly, observation would be used to determine exactly how and when technology is incorporated into the lessons taught. This would be naturalistic observation since it would be done directly in the classroom during actual lessons. I would use quantitative and qualitative observational data to get the best results. By using observation, I can note whether it is the teacher using the technology to demonstrate or if it is the students directly using the technology to practice. This can make a big difference on the results. I believe students would be more motivated and engaged if they were personally using the technology, such as an iPad, to study or practice math concepts. Of course, any of the other data collection options could be beneficial in this kind of study as well.

Ch. 9 -How do qualitative researchers approach the issue of sampling? How does sample size differ in quantitative versus qualitative research? Why?

There are many different approaches to sampling when conducting qualitative research. Sampling is always purposeful and is referred to as “criterion-based selection” because the researcher has certain requirements that need to be met when selecting the participants (Johnson & Christensen, 2012, p. 235). Comprehensive sampling, maximum variation sampling, homogeneous sampling, extreme-case sampling, typical-case sampling, critical-case sampling, negative-case sampling, opportunistic sampling, and mixed purposeful sampling are all ways qualitative researchers approach the issue of sampling.

Like the names suggest, quantitative researchers want a large quantity of participants for its sample size. Bigger is better. They believe they get more accurate results when there is a larger sample size. Numbers, percentages, and hard data are all the key ingredients for quantitative research. On the other hand, qualitative researchers focus on the quality of the data they collect. They do not necessary feel they need to have a large population of participants. Researchers use intensive study groups to focus on certain cases or groups of people. They select cases according to what their focus of study is on. They look for certain characteristics in their participants whereas quantitative would prefer not to know their participants. One might assume qualitative research is “deeper” than quantitative research.

Ch. 10- What types of educational research studies would be most susceptible to the different threats to internal validity? Provide possible realistic examples (not already provided in the course materials for this chapter).

An educational research study that involved a pretest and a posttest could be vulnerable to a history threat, which “refers to any event, *other than the planned treatment* event, that occurs between the pretest and posttest measurement and has an influence on the dependent variable.” For example, a teacher begins a history unit over the Cold War. The students have little knowledge of the event as shown on the pretest. Following the unit closure, students do extremely well on the posttest. However, it was discovered most of the students watched a new movie on the History Channel over the Cold War. Could this movie have an effect on their new knowledge? It is now not for sure the teacher’s instruction was the sole reason for student improvement. This would be a one-group design since it is one history class.

Another example of a threat to educational research studies is instrumentation, which “refers to any change that occurs in the way the dependent variable is measured in the research study.” For example, a researcher is attempting to determine the effect of a new instructional technique on student achievement. In the beginning, the achievement test is valid. However, it is long and the student becomes tired of the testing. The researcher may shorten the test to accommodate the student. The measure of the dependent variable (student achievement) has been altered; therefore, it may not be valid.

Ch. 11- Why is random assignment (rather than random selection) so important in experimental research?

Which method of controlling for extraneous variables seems most logical to you? Why?

Which is the most powerful research design: the pretest-posttest control group design or the posttest-only control-group design? Why?

Random assignment ensures the differential influence of extraneous variables will be controlled because participants are randomly assigned to the various comparison groups (Johnson & Christensen, 2012, p. 313). This way, participants are not purposely put into groups. Otherwise, researchers run the risk of influencing the outcome if groups are similar in ability or intelligence. "Random assignment controls for both known and unknown variables" (Johnson & Christensen, 2012, p. 288). Therefore, it seems the most logical to use random assignment because it has the ability to control either type of variable. I also feel it would be important to use counterbalancing when conducting repeated-measures research designs in order to control extraneous variables. Counterbalancing ensures all participants are exposed to all experimental conditions but in different orders.

I am unsure whether or not the pretest-posttest control-group design is more powerful than the posttest-only control-group design, but I personally believe it is simply because you have the pretest and posttest to compare. To me, this makes it a stronger design. A researcher has hard evidence as to where the participant started and where they ended. While unknown extraneous variables could exist, the pretest-posttest control-group design keeps history and maturation controlled since both the experimental group and control group would feel the effects (Johnson & Christensen, 2012).

Ch. 12- Explain the difference between strong experimental research designs and quasi-experimental research designs. Why are quasi-experimental designs limited in their ability to make causal inferences?

Strong experimental research designs provide for "maximum control of potentially confounding variables" (Johnson & Christensen, 2012, p. 296). Quasi-experimental research designs do *not* provide "full control of potential confounding variables primarily because it does not randomly assign participants to comparison groups" (Johnson & Christensen, 2012, p. 319). Quasi-experimental research is done when it is impossible to randomly assign participants to groups because they are already in set groups such as in a classroom. There are many factors that are involved; therefore, researchers have no choice but to use the predetermined groups.

Causal inferences can only be made in quasi-experimental research designs when data is collected that determines plausible rival explanations are unlikely. Quasi-experimental research meets two of the three requirements for a causal relationship: 1) it manipulates conditions so cause and effect is easily seen, and 2) cause and effect covariation is tested. However, since quasi-experimental research does not use random assignment it is tough to rule out rival hypotheses, which is the third requirement to

have a causal relationship (Johnson & Christensen, 2012). Therefore, while causal inferences can be made in quasi-experimental research designs, these inferences are not as solid as those in strong experimental research designs.

Ch. 13-Why is it that evidence for cause-and-effect is better in well-conducted randomized experiments (i.e., strong experiments) than in nonexperimental quantitative research?

Why do you think an association (i.e., a relationship between two variables) is sometimes assumed to imply causation by some people?

Strong experiments allow for all three required conditions for causation to be met, especially condition 3, which states the relationship between variable A and variable B must *not* be due to some confounding extraneous or “third” variable. In nonexperimental quantitative research, you run into the difficulty of the “third-variable problem” which is present whenever uncontrolled, confounding extraneous variables are present (Johnson & Christensen, 2012, p. 352). Well-conducted randomized experiments have a strong control over confounding extraneous variables.

I think an association is sometimes assumed to imply causation by some people because they fail to look at the extraneous variables. Sometimes, an association is actually a spurious relationship because of a third variable. Table 13.2 was enlightening as well as humorous to read because of the crazy spurious relationships listed. I felt one of the most contradictory examples was “number of doctors in region and number of people dying from disease.” One would think there was something wrong with the doctors, when, in fact, it’s simply due to population density (Johnson & Christensen, 2012). After reading this chapter, I realize the importance of checking for confounding extraneous variables before assuming a cause-and-effect relationship.

Ch. 14-After looking at Table 14.1 in your book: What do you think are the biggest strengths of qualitative research? What are the biggest weaknesses of qualitative research? Explain.

What do you think about the concepts of postmodernism and poststructuralism?

I also agree that **naturalistic inquiry** is one of the greatest strengths of qualitative research. I believe when a researcher is in the real-world setting observing natural reactions and occurrences is when they collect the most accurate data. Secondly, **inductive analysis and creative synthesis** allows the researcher to plunge deep into the data to discover relationships that may have been overlooked if it had been quantitative research. It is a more open-ended approach to analyzing the results.

On the other hand, I feel **personal experience and engagement** may have a negative effect and therefore be a weakness of qualitative research. It is tricky to keep your feelings from interfering with your work and your results. Perhaps a researcher who became close to a student with behavioral problems would not make the condition seem as harsh in the research results because they felt sorry for the student. This is strictly

my opinion, and I may be way off, but sometimes I feel you have to keep your personal feelings out of the business you are conducting in order to get the most truthful results.

I was somewhat familiar with the terms postmodernism and poststructuralism because I took a humanities class during my undergraduate work. However, I had forgotten what exactly they meant. I agree with poststructuralism viewpoints that knowledge is always changing and if someone is considered to have great knowledge, it depends on the current society and social-cultural contexts. Postmodernism can be easily seen in our culture today. We are constantly looking to change and make things better for ourselves. Nothing is never good enough. Sometimes I think it's hard to keep up with our ever-changing society!

Ch. 16-Review Tables 16.1, 16.2, and 16.3. What do you see as the biggest advantage of each of the following: qualitative research, quantitative research, and mixed research?

Should a researcher pledge allegiance to just one methodological paradigm? Explain your reasoning.

For quantitative research, I feel the greatest advantage is the fact that you can study large numbers of people using quick, precise, and numerical data collection. Thus, findings can be generalized and applied to the majority of a society. It seems to be the easiest form of research to me.

On the other hand, qualitative research provides more substantial, in-depth research. I feel the greatest advantage to using qualitative research is that using it can provide "detailed information about why a phenomenon occurs" (Johnson & Christensen, 2012, p.429). I seem to find this kind of research more interesting because it's more personable.

Finally, there is mixed research. For a researcher struggling to decide between quantitative and qualitative, this appears to be the perfect solution. The greatest advantage to using mixed research is the fact that one can "strategically combine quantitative and qualitative research strengths in a single study to cover a single purpose better or to cover multiple purposes well in a single study" (Johnson & Christensen, 2012, p.433). It would be like having the best of both worlds.

I do not think a researcher should have to be committed to only one type of research method. It has to depend on the question being asked and the type of study that will be conducted. In some cases, quantitative will be better, other times it may need to be qualitative. If neither can be chosen, a mix of both can be used. With that being said, I do feel a researcher would get better each time and more efficient if they stuck to one methodological paradigm. They would be more familiar with the procedures. Overall, I think it is entirely up to the researcher(s) to choose.

Ch. 17-What is the purpose of calculating measures of central tendency? What is the purpose of calculating measures of variability? What is the purpose of calculating measures of relative standing?

What are some of the statistical procedures used to examine the relationship between two variables? What are some procedures used when there are more than two variables? How do you decide which statistic to calculate?

The purpose of calculating measures of central tendency is so one can know what a typical score was and be able to compare their score to that one. Calculating measures of variability tells you how similar or different people are according to the variable being studied (Johnson & Christensen, 2012). If the numbers are all close to one another, there's little variability (homogeneous). If the numbers are all over the place, there's high variability (heterogeneous). Lastly, the purpose of calculating measures of relative standing is to provide information to show where a score falls in relation to the other scores amongst the data distribution (Johnson & Christensen, 2012).

If you want to examine the relationship between two variables, you could use simple regression. This is a statistical procedure used based on one dependent variable and one independent variable. Scatter plots would also be useful for two variables. However, if there are more than two variables, you might need to use multiple regression. Again, statistical procedures are used but this time it is based on one dependent variable and two or more independent variables (Johnson & Christensen, 2012). A contingency table could also be used to show the relationships amongst two or more variables. A researcher must make the choice as to which statistic to calculate based on what he/she feels would provide the most useful data.

Ch. 18-Provide an example of each of the types of hypotheses (null and alternative) using an educational research topic that is not mentioned in the course materials for this chapter.

Explain the relationship between probability value, significance level, and hypothesis testing. How are they all related to each other? How are they all used in inferential statistics? How do they relate to both Type I and Type II errors?

One educational research topic I've always been particularly interested in is the effects of physical activity on brain development in elementary students. A null hypothesis would state, "There are no effects of physical activity on brain development." An alternative hypothesis would claim, "There are several effects of physical activity on brain development." I know I try to incorporate physical activity in the classroom whenever possible to get the kids' "brain juices" flowing. :)

Hypothesis testing is a branch of inferential statistics that deals with how well the sample data will support a null hypothesis (Johnson & Christensen, 2012). Probability value refers to the probability of seeing your results from your study if the null hypothesis were true. For example, previous research has shown there are effects of

physical activity on brain development; therefore, the probability would be very low that one would see no effects on brain development following physical activity. Thus, the null hypothesis could be rejected. The significance level is the cutoff point that the researcher uses to determine when to reject the null hypothesis (Johnson & Christensen, 2012). Typically, this is 0.5. A probability value that is 0.5 or less means the null hypothesis can be rejected. Anything higher, and the null hypothesis should be accepted. Going back to my previous example, if researchers found the probability of seeing no results on brain development following physical activity was 0.049, they could reject the null hypothesis and claim there are effects on brain development.

A researcher has to be careful when rejecting null hypothesis. They need to make sure the probability value is accurate and aligns with their significance level. If a researcher rejects a null hypothesis that is actually true, they have been charged with a Type I error. On the other hand, if they fail to reject a null hypothesis that is false, they are committing a Type II error (Johnson & Christensen, 2012).

*I have to say, for me, this was probably the hardest chapter out of this whole book to read. I never took a statistics class so maybe that's why. Hopefully this is right!

Ch. 19-What does coding involve? What challenges exist where coding is concerned? What coding and/or categorizing technique resonated the most with you? Why?

How do you think a qualitative researcher would define "relationship" in data analysis? How does this differ from how a quantitative researcher would define a relationship?

Coding is "marking segments of data with symbols, descriptive words, or category names" (Johnson & Christensen, 2012, p.520). Basically, it makes the research data easier to read and interpret. Some challenges with coding are intercoder reliability and intracoder reliability. If one researcher codes this way, and another researcher codes another way, the codes are inconsistent (you do NOT have intercoder reliability). Along those same lines, if you are the researcher that is coding data and you do not remain consistent with your codes, it will be difficult for someone to read (you do NOT have intracoder reliability). I feel I would have the most trouble with intercoder reliability. I think back to my days as a bank teller. When trying to find information, it was difficult sometimes because I would file or label one way, and the other tellers would do it a different way. Finally, we had to get all on the same page and do it the same way because we were driving ourselves crazy!

A qualitative researcher defines a relationship as "many relations or connections between things, including but not limited to variables" (Johnson & Christensen, 2012, p.531). Thus, as long as there is somewhat of a connection, there is a relationship. On the other hand, a quantitative researcher is more precise. They would define a relationship based on the relation or connection only among variables (Johnson & Christensen, 2012, p.531). Quantitative researchers need hard evidence and data in order to claim there is a relationship.

Reference

Johnson, B. & Christensen, L. (2012). *Educational Research: Quantitative, Qualitative, and Mixed Approaches (4th Ed.)*. Thousand Oaks, CA: Sage. ISBN 978-1-4129-7828-6.