

# Study Design and Data Analysis in SoTL

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	Study Design	Exemplar SoTL projects:	Quantitative Analysis Options	Qualitative Analysis Options
Descriptive Research	<p>Descriptive research characterizes a group of people, a context, or a phenomenon. These studies do not seek to establish a causal relationship; rather, they provide information about “what is” occurring or being observed regarding the focus of study.</p> <p><u>Descriptive studies include:</u></p> <ul style="list-style-type: none"> <li>• Observational methods</li> <li>• Case study methods</li> <li>• Survey methods</li> </ul>	<ul style="list-style-type: none"> <li>• survey students’ re: practices in using print vs. online textbooks to support learning.</li> <li>• observe how students’ use of technology in the classroom impacts attention</li> <li>• study high achieving students in a course to predict practices/variables of success to share with future students</li> </ul>	<p>Quantitative data in a descriptive study is often reported in the form of descriptive statistics (e.g., mean, median, mode) along with standard deviations. Statistics might be used here, depending on the data collected and the topic being studied.</p> <p>These data might emerge from test scores, grades on a course assignment or project, survey data, or frequency data.</p>	<p>Qualitative data in a descriptive study is reported as narrative, reflection, open-ended response, field note, etc. Such data will need to be further analyzed for themes, categories, or patterns.</p> <p>Common qualitative approaches to data analysis in SoTL include: case study, action research processes, analytic induction, ethnography, comparative analysis, frame analysis, grounded theory, and interpretive phenomenology, among others.</p>
Correlational Research	<p>Correlational research seeks to determine whether a relationship exists between two or more variables, but cannot determine if one variable causes another. Variables aren’t manipulated; rather, they are observed to determine any relationship that might exist between them.</p> <p>Note that some sources identify correlational research as a quantitative-only subset of descriptive research, as some descriptive research might suggest a correlation found via grounded theory or other qualitative methods of research.</p>	<ul style="list-style-type: none"> <li>• Determine the relationship between number of hours studying and success on a quiz/test</li> <li>• Identify whether there is a link between the use of peer editing and performance on a writing assignment</li> <li>• Understand whether the use of social media helps students to summarize course content effectively.</li> </ul>	<p>Correlational research is a quantitative method of inquiry. Correlation can only be determined for quantifiable data. These are data in which numbers are meaningful, usually quantities of some sort. It cannot be used for purely categorical data, such as gender, brands purchased, or favorite color.</p> <p>Statistics are used to determine a correlation coefficient to identify positive, negative, or zero correlation. One thing to keep in mind is that any identified correlation does not mean that one variable caused the other to react. Instead, correlations simply define that a relationship exists.</p>	<p>Qualitative data analysis is not undertaken for correlational research, as numerical data is needed to calculate a correlation coefficient.</p>

	<b>Study Design</b>	<b>Exemplar SoTL projects:</b>	<b>Quantitative Analysis Options</b>	<b>Qualitative Analysis Options</b>
<b>Experimental and Quasi-experimental Research</b>	<p>Experimental and quasi-experimental research designs seek to manipulate one variable and control all others to investigate cause/effect relationships. All participants are assigned to either a control or experimental group. An intervention is applied to the experimental group. The control group has no intervention applied.</p> <p>The key difference between experimental and quasi-experimental designs is the concept of randomization. If participants are assigned to control and experimental groups randomly, the research design is experimental. Non-random group assignment yields a quasi-experimental research design. True experimental research is considered the gold standard of research by many researchers, because random group assignment leads to optimal internal validity. In situations where random group assignment is not possible or ethical, quasi-experimental designs offer an alternative that allows the research to continue and still produce valid results.</p> <p>Almost no SoTL qualifies as experimental in nature due to inherent ethical and logistical characteristics of SoTL that makes this research counter-indicated.</p> <p>One of the most common quasi-experimental designs for SoTL research is the pre-test/post-test with no control group design.</p>	<ul style="list-style-type: none"> <li>• Does the use of simulated patients help nursing students improve observational skills?</li> <li>• Do architecture students who initially design structures by hand understand the concept of space more deeply?</li> <li>• Do history students exposed to guided reading demonstrate a deeper understanding of historical imagination?</li> </ul>	<p>Experimental design lends itself to more straightforward and simpler types of statistical analysis. Primarily due to the lack of randomization, quasi-experimental studies usually require more advanced statistical procedures. Quasi-experimental designs may also utilize surveys, interviews, and observations which may further complicate the data analysis.</p> <p>Quantitative analysis requires several steps. First numeric data is assigned a level (nominal, ordinal, interval, or ratio). Next, descriptive statistics are calculated for data (e.g., means, standard deviations). For some studies, descriptive statistics may be adequate; however, if you want to make inferences or predictions about your population, inferential statistics (e.g., t-test, ANOVA, regression) may be indicated.</p>	<p>Experimental and quasi-experimental designs may yield data that is descriptive (e.g., surveys, interviews, observations) that require qualitative analyses. Similar to information provided above for descriptive research, any qualitative data will need to be further analyzed for themes, categories, or patterns.</p> <p>Common qualitative approaches to data analysis in SoTL include: case study, action research processes, analytic induction, ethnography, comparative analysis, frame analysis, grounded theory, and interpretive phenomenology, among others.</p>

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