PsycLearn: Research Methods | Module Topics for Course

13 modules:

- Research Psychology and Science
- Getting Started
- Ethical Practices
- Reviewing the Literature
- Research Questions and Designs
- Sampling and External Validity
- Correlational Design and Construct Validity
- Measuring and Reliability
- Between Group and Within Group Research Design
- Manipulating Variables
- Analyzing and Interpreting Data
- Reporting Results
- Getting More Research Experience
PsycLearn: Research Methods | Topic Coverage & Learning Objectives Aligned to APA Guidelines 2.0

The APA Guidelines for the Undergraduate Psychology Major Version 2.0 are often cited by psychology departments as the foundation of curricular outcomes. Learning objectives clearly articulate the goals to be met by students as they navigate content and interact with practice and mastery activities. Here we provide alignment of the learning objectives specified in PsycLearn: Research Methods to the outcomes established by the APA Guidelines 2.0.

About the APA Guidelines 2.0

Developed by the American Psychological Association (APA), the APA Guidelines for the Undergraduate Psychology Major Version 2.0 serve to benchmark quality in the delivery of psychology instruction at institutions of higher education, producing curricular continuity and comparable educational experiences in online-only and blended learning environments.

The APA Guidelines 2.0 capture a set of optimal expectations for performance by undergraduates who are engaged in the study of psychology. The document outlines five broad goals and corresponding student learning outcomes that represent reasonable departmental expectations for the undergraduate psychology major across different kinds of educational contexts. The selection of the five goals and corresponding student learning outcomes reflects emerging best practices from the scholarship of teaching and learning in psychology as well as the experiences reported from academic program reviewers.

See page 10 for an overview of each goal. You can read the comprehensive APA Guidelines 2.0 at on.apa.org/PL-guidelines.

- **Goal 1**: Knowledge Base in Psychology
- **Goal 2**: Scientific Inquiry and Critical Thinking
- **Goal 3**: Ethical and Social Responsibility in a Diverse World
- **Goal 4**: Communication
- **Goal 5**: Professional Development
## PsycLearn: Research Methods

<table>
<thead>
<tr>
<th>Module Description</th>
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<th>Outcomes and Indicators</th>
</tr>
</thead>
</table>
| **Module 1. Psychology and Science**  
Scientific research is an important tool in our society and understanding how science progresses and what it can tell us about the world is essential to all members of society. This module will introduce students to scientific research by presenting several examples of why science is important in life and in our society. Students will learn about scientific practices used to objectively describe and explain phenomena. They will also explore the many ways that psychologists use research methods to advance our knowledge of the world. Importantly, students will learn how to identify the characteristics of good scientific research and contrast them with the characteristics of pseudoscience, which often masquerades as science.  
- Research applies a systematic, scientific method  
- Scientific research has relevance to daily lives  
- What is and what is not science—pseudoscientific claims |  
- Explain how science is relevant to our daily lives.  
- Describe how science is relevant to our society.  
- Identify the major elements of a scientific study from its abstract.  
- Draw a connection between the findings reported in the abstract and the relevance of a study to society.  
- Review and apply the steps of the scientific method.  
- Distinguish between basic and applied research.  
- Explain how scientific knowledge progresses.  
- Identify the characteristics of good scientific practices.  
- Distinguish pseudoscientific claims from true scientific findings. |  
1.3 Describe applications of psychology  
1.3A Articulate how psychological principles can be used to explain social issues, address pressing societal needs, and inform public policy  
3.3 Adopt values that build community at local, national, and global levels  
3.3e Articulate psychology’s role in developing, designing, and disseminating public policy  
2.1 Use scientific reasoning to interpret psychological phenomena  
2.1B Develop plausible behavioral explanations that rely on scientific reasoning and evidence rather than anecdotes or pseudoscience |
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<thead>
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| **Module 2. Getting Started**  
Scientific research seeks to answer one or more questions about why things are the way they are. This module emphasizes the importance of a well-stated research question as the foundation of good and valuable research. The type of question asked will determine the type of research design and the type of outcomes that can be determined from a study. This module focuses on the process of asking a good research question.  
- What makes a good research question?  
- Types of variables and relationships among variables | **List the different types of information that a research question might solicit.**  
- Identify the types of variables and relationships of interest in research questions.  
- Identify the criteria for a good research question.  
- Evaluate the quality of a research question.  
- Explain how a hypothesis relates to a research question.  
- List several ways that a study can make a positive contribution to a field or body of knowledge.  
- Explain how theories are developed from a body of research evidence.  
- Describe why studies are replicated.  
- Describe the role of literature review in refining a research question and writing a hypothesis. | **2.3 Engage in innovative and integrative thinking and problem solving**  
**2.3a Recognize and describe well-defined problems**  
**2.4 Interpret, design, and conduct basic psychological research**  
**2.4c Define and explain the purpose of key research concepts that characterize psychological research (e.g., hypothesis, operational definition)**  
**2.4C Accurately identify key research concepts in existing and proposed research projects**  
**2.2 Demonstrate psychology information literacy**  
**2.2C Develop a comprehensive strategy for locating and using relevant scholarship (e.g., databases, credible journals) to address psychological questions** |
| **Module 3. Ethical Practices**  
Ethical considerations are a critical component of any research study. In the United States, researchers use the Belmont Report, and psychologists abide by the American Psychological Association’s Ethical Principles of Psychologists and Code of Conduct (APA Ethics Code) to guide ethical decisions. This module examines the history of ethical practices in research and outlines current ethical issues and guidelines.  
- Codes and standards  
- Application to contemporary contexts | **Describe guidelines researchers follow for ethical research.**  
**Recommend steps necessary for designing ethical research projects.**  
**Evaluate ethical issues in research.** | **3.1 Apply ethical standards to evaluate standards to evaluate psychological science and practice**  
**3.1a Describe key regulations in the APA Ethics Code for protection of human or nonhuman research participants**  
**3.1A Evaluate psychological research from the standpoint of adherence to the APA Ethics Code in psychological research involving human or nonhuman research participants**  
**3.1b Identify obvious violations of ethical standards in psychological contexts**  
**3.1B Justify recommendations for consequences for ethical violations based on APA ethics Code requirements** |
Module 4. Reviewing the Literature
Whether writing a research paper, designing a research study, or making an evidence-based decision at work, what other researchers have already explored and learned about the topic must be located, read, and critically synthesized. In scientific research, this process is known as the literature review. This module focuses on distinguishing between types of sources; locating, accessing, and organizing sources; and extracting important information from sources.
- Locating and identifying reliable information
- Reading and analyzing research articles

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<th>2.2 Demonstrate psychology information literacy.</th>
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<tr>
<td>2.2A Read and summarize complex ideas accurately, including future directions, from psychological sources and research</td>
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<td>2.2B Describe the characteristics and relative value of different information sources (e.g., primary vs. secondary, peer reviewed vs. nonreviewed, empirical vs nonempirical)</td>
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<tr>
<td>2.2C Develop a comprehensive strategy for locating and using relevant scholarship (e.g., databases, credible journals) to address psychological questions</td>
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<td>2.2D Articulate criteria for identifying objective sources of psychology information</td>
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<td>2.2D Evaluate psychology information based on the reliability, validity, and generalizability of sources</td>
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<td>2.4D Replicate or design and conduct simple scientific studies (e.g., correlational or two-fac-tor) to confirm a hypothesis based on operational definitions</td>
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<tr>
<td>2.4D Design and conduct complex studies to confirm a hypothesis based on operational definitions</td>
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- Distinguish between scholarly and non-scholarly sources of information.
- Identify five methods for finding scholarly sources.
- Explain the relevance of peer review in scholarly research.
- Identify different types of journal articles.
- Extract key information from a research article.
- Analyze and compare the findings of research articles.
### Module Description

**Module 5. Research Questions and Designs**
After working through how to develop a research question and hypothesis, and after learning how to conduct a literature review to find out what is known about your topic, students will consider a variety of possible research designs and their strengths and weaknesses. This module presents the four basic types of research design and the key similarities and differences between them. It also introduces different standards for evaluating the quality of research.

- The research question indicates the design
- Measurement versus manipulation
- Types of study design (descriptive, correlational, experimental, and quasi-experimental)
- Operational definitions for variables
- Overview of four types of validity

**Module 6. Sampling and External Validity**
The sampling method used for a study directly affects the external validity of that study. External validity is the extent to which research findings can be generalized to individuals, cultures, situations, and settings that differ from the original study. This module presents techniques for locating and accessing participants for a study, as well as techniques for evaluating a study's external validity.

- Probability and nonprobability sampling techniques

### Learning Objectives

- Identify and describe descriptive, correlational, experimental, and quasi-experimental research designs.
- Describe ways to measure or manipulate a variable.
- Select a research design that is best suited to examining your research question.
- List and describe four types of validities.

- Select a group of participants that is representative of the population you wish to study.
- Evaluate research designs for external validity.
- Identify common threats to external validity.
- Explain when external validity is not essential to research.

### Outcomes and Indicators

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<td>2.4 Interpret, design, and conduct basic psychological research</td>
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<tr>
<td>2.4A Evaluate the effectiveness of quantitative and qualitative research methods in addressing a research question</td>
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<td>2.4D Design and conduct complex studies to confirm a hypothesis based on operational definitions</td>
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<td>2.4E Design and adopt high-quality measurement strategies that enhance reliability and validity</td>
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<td>2.4 Interpret, design, and conduct basic psychological research</td>
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<td>2.2D Evaluate psychology information based on the reliability, validity, and generalizability of sources</td>
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<td>2.4B Limit cause–effect claims to research strategies that appropriately rule out alternative explanations</td>
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<td>2.4E Design and adopt high-quality measurement strategies that enhance reliability and validity</td>
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<td><strong>Module 7. Correlational Design and Construct Validity</strong>&lt;br&gt;Researchers must ensure that measurements accurately and appropriately estimate the underlying constructs—an idea known as construct validity. This module explores different ways to measure variables and ways to ensure construct validity in those measurements.&lt;br&gt;• Correlational designs&lt;br&gt;• Observational measures&lt;br&gt;• Construct validity and reliability</td>
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<td><strong>Module 8. Measuring and Reliability</strong>&lt;br&gt;An important skill in research is designing proper measurement of variables that will allow research questions to be answered. This module presents different types of questions, methods to measure them accurately, and ways to assure the construct validity of measures.&lt;br&gt;• Self-report measures&lt;br&gt;• Physiological and archival measures</td>
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### Module Description

**Module 9. Between Group and Within Group Research Designs**
Experiments are important because they have the potential to demonstrate that changes in one variable may cause changes in another variable, thus establishing a cause-effect relationship between the independent and dependent variables. This module introduces basic experimental research designs.
- Between-subjects Design
- Within-subjects Design

**Module 10. Manipulating Variables**
When an experiment is free from flaws in its internal structure, it is said to have high internal validity. To assess the internal validity of an experiment, we must look closely at the order in which variables are manipulated and measured, the covariance between variables, and the possibility of alternative explanations for the experiment’s outcome. This module will introduce students to experimental research designs as well as common threats to internal validity and ways to prevent or control those threats.
- Experimental designs
- Internal validity
- Confounding variables and methods of control

### Learning Objectives

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<td>Explain the purpose of experimental manipulation.</td>
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<td>Describe and apply common between-groups research designs and a within-groups research designs.</td>
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<td>Explain methods to counterbalance research designs.</td>
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<td>Distinguish between different factorial and regression designs.</td>
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<td>2.4B Limit cause–effect claims to research strategies that appropriately rule out alternative explanations</td>
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<td>2.4b Discuss the value of experimental design (i.e., controlled comparisons) in justifying cause–effect relationships</td>
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<td>2.4E Design and adopt high-quality measurement strategies that enhance reliability and validity</td>
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<td>2.1E Use strategies to minimize committing common fallacies in thinking that impair accurate conclusions and predictions</td>
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| **Module 11. Analyzing and Interpreting Data**  
Statistical analyses are important techniques used in research. This module examines basic descriptive and inferential statistics and discusses how these tools are applied to analyze and answer research questions. Students are introduced to statistics often encountered in journal articles and in various research designs.  
- Types of data; scales and levels of measurement  
- Descriptive statistics  
- Measuring relationships  
- Comparing scores  
- Correlational Coefficient  
- Implications for research design and statistical validity | - Explain the difference between descriptive and inferential statistics.  
- Identify the level of measurement for a variable.  
- Decide when and how to compute measures of central tendency and dispersion.  
- Calculate and describe a correlation coefficient.  
- Identify the importance of reporting statistical significance, effect size, and a confidence interval.  
- Decide when to use a parametric or nonparametric test  
- Choose the appropriate statistical test and write the corresponding hypotheses.  
- Describe a Type I and Type II error.  
- Explain the importance of statistical power. | **APA Guidelines for the Undergraduate Psychology Major, 2.0**  
4.1F Communicate quantitative data in statistics, graphs, and tables  
4.1f Interpret quantitative data displayed in statistics, graphs, and tables, including statistical symbols in research reports |
| **Module 12. Reporting Results**  
After a research study is complete, the results must be reported to continue the cycle of the scientific method. Common forms of reporting research include a research paper, a scientific poster, and an oral presentation. This module focuses on using and identifying scientific writing, including characteristics of APA Style, and how to report research in these three common forms.  
- Writing a paper  
- Preparing a poster  
- Preparing an oral presentation  
- Attending conferences | - Explain the importance of reporting research within the cycle of the scientific method.  
- Identify scientific writing that employs APA Style.  
- Apply techniques to reduce bias and avoid plagiarism in writing.  
- Format a research paper, including citations and references, in APA style.  
- Identify important sections of research paper.  
- Describe best practices for creating and presenting a scientific poster and a scientific talk.  
- List advantages for each form of reporting research. | **APA Guidelines for the Undergraduate Psychology Major, 2.0**  
4.1d Write using APA style  
4.1e Recognize and develop overall organization (e.g., beginning, development, ending) that fits the purpose  
4.1F Communicate quantitative data in statistics, graphs, and tables  
4.2D Integrate visual and oral elements |
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<td><strong>Module 13. Getting More Research Experience</strong>&lt;br&gt;Learning about research and developing research skills in the classroom is great. Continuing to learn and develop skills by working on a real research project is even better. This module will introduce the benefits of getting involved in research, ways students can contribute to a research project, and how to find research opportunities.</td>
<td>- List and describe ways that research experience will help you get a job.&lt;br&gt;- List and describe ways that research experience will benefit if you plan to go to graduate school.&lt;br&gt;- List and describe ways that research experience will help you contribute to the community.&lt;br&gt;- Describe the ways you might contribute to someone else’s research project at each step in the scientific method.&lt;br&gt;- List independent and directed study opportunities on your campus.&lt;br&gt;- Locate community-based research opportunities off campus.&lt;br&gt;- Find contact information for opportunities and resources related to research.&lt;br&gt;- Find the names and contact information for faculty members in the department who are doing research that is interesting to you and discuss the similarities between their interests and your interests.&lt;br&gt;- Create a strategy for finding ways to get involved in research on and off campus.</td>
<td>5.1 Apply psychological content and skills to career goals&lt;br&gt;5.5 Develop meaningful professional direction for life after graduation&lt;br&gt;5.5D Actively seek and collaborate with a mentor</td>
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<td>• Finding and leveraging opportunities in research settings&lt;br&gt;• Applying skills in the workforce</td>
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<td>Goal</td>
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<td><strong>Goal 1: Knowledge Base in Psychology</strong></td>
<td>Students should demonstrate fundamental knowledge and comprehension of the major concepts, theoretical perspectives, historical trends, and empirical findings to discuss how psychological principles apply to behavioral phenomena. Students completing foundation courses should demonstrate breadth of their knowledge and application of psychological ideas to simple problems; students completing a baccalaureate degree should show depth in their knowledge and application of psychological concepts and frameworks to problems of greater complexity.</td>
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<td><strong>Goal 2: Scientific Inquiry and Critical Thinking</strong></td>
<td>The skills in this domain involve the development of scientific reasoning and problem solving, including effective research methods. Students completing foundation-level courses should learn basic skills and concepts in interpreting behavior, studying research, and applying research design principles to drawing conclusions about psychological phenomena; students completing a baccalaureate degree should focus on theory use as well as designing and executing research plans.</td>
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<td><strong>Goal 3: Ethical and Social Responsibility in a Diverse World</strong></td>
<td>The skills in this domain involve the development of ethically and socially responsible behaviors for professional and personal settings in a landscape that involves increasing diversity. Students completing foundation-level courses should become familiar with the formal regulations that govern professional ethics in psychology and begin to embrace the values that will contribute to positive outcomes in work settings and in building a society responsive to multicultural and global concerns. Students completing a baccalaureate degree should have more direct opportunities to demonstrate adherence to professional values that will help them optimize their contributions and work effectively even with those who do not share their heritage and traditions. This domain also promotes the adoption of personal and professional values that can strengthen community relationships and contributions.</td>
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<td><strong>Goal 4: Communication</strong></td>
<td>Students should demonstrate competence in writing and in oral and interpersonal communication skills. Students completing foundation-level courses should be able to write a cogent scientific argument, present information using a scientific approach, engage in discussion of psychological concepts, explain the ideas of others, and express their own ideas with clarity. Students completing a baccalaureate degree should produce a research study or other psychological project, explain scientific results, and present information to a professional audience. They should also develop flexible interpersonal approaches that optimize information exchange and relationship development.</td>
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<td><strong>Goal 5: Professional Development</strong></td>
<td>The emphasis in this goal is on application of psychology-specific content and skills, effective self-reflection, project-management skills, teamwork skills, and career preparation. Foundation-level outcomes concentrate on the development of work habits and ethics to succeed in academic settings. The skills in this goal at the baccalaureate level refer to abilities that sharpen student readiness for postbaccalaureate employment, graduate school, or professional school. These skills can be developed and refined both in traditional academic settings and in extracurricular involvement. In addition, career professionals can be enlisted to support occupational planning and pursuit. This emerging emphasis should not be construed as obligating psychology programs to obtain employment for their graduates but instead as encouraging programs to optimize the competitiveness of their graduates for securing places in the workforce.</td>
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