## Undergraduate Research Manual

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Undergraduate Research: Introduction

Q: What is Undergraduate Research?

A: Undergraduate research is a collaboration between a student and a faculty member in making a creative, original contribution to a given discipline, first by investigating that topic, then by sharing their findings with the academic community, usually through a conference presentation or journal publication.

This research is not limited to the traditional sciences, but includes the arts, education, engineering, health sciences, humanities, or any other topic which interests a student. Original creative work is also included (writing a short story or screenplay with a faculty mentor, for example). Research projects can be anything from the investigation of the growth of cancer cells in cats to a study of common themes in 18th century Russian poetry, to interviewing survivors of a natural disaster, or working with a local business in designing a new marketing campaign.

The research enhances the student’s involvement in and knowledge of a given field and brings new ideas to all who are interested in that field, therefore encouraging further research or creative work.

Q: Why do undergraduate research?

A: Undergraduate Research…

• Helps you obtain greater knowledge of a field beyond the classroom
• Demonstrates application of knowledge beyond the classroom
• Demonstrates initiative, leadership skills, and an ability to collaborate
• Demonstrates good communication skills (i.e., conference presentation/publication)
• Enhances your resume

Q: Who does undergraduate research?
A: Anyone may choose to conduct research as an undergraduate at WCU.

• Students with declared and undecided majors
• Students across all disciplines and majors
• Both Honors and non-Honors students
• Freshman and upperclassmen
Academic Departments & Potential Advisors

**College of Arts and Sciences**

- Anthropology and Sociology
- Biology
- Chemistry and Physics
- Communication
- English
- Geosciences and Natural Resource Management
- History
- Mathematics and Computer Science
- Modern Foreign Languages
- Philosophy and Religion
- Political Science

**College of Business**

- Accounting, Finance, Information Systems and Economics
- Business Administration & Law and Sports Management
- Center for Entrepreneurship & Innovation
- Global Management and Strategy
- Entrepreneurship, Sales and Marketing, and Hospitality & Tourism

**College of Education and Allied Professions**

- Human Services
- Psychology
School of Teaching and Learning

College of Fine and Performing Arts

- School of Art and Design
- School of Music
- School of Stage and Screen

College of Health and Human Sciences

- Communication Sciences and Disorders
- Criminology and Criminal Justice
- School of Health Sciences
- School of Nursing
- Social Work
- Physical Therapy

Kimmel School of Construction Management and Technology

- Construction Management
- Engineering and Engineering Technology
Hunter Library

Getting Started

Hunter Library at Western Carolina University is a great place to start looking for materials and sources for an undergraduate research project. The professional staff at Hunter Library is a group of expert researchers who are eager to help students with projects.

Contact: 828.227.7465 or visit http://researchguides.wcu.edu/help.

Knowing When to Ask an Expert for Help

One important aspect of being information-literate is knowing when to ask an expert for help. When working on an academic project, this expert might be a professor, a librarian, a tutor, or someone in the Writing and Learning Commons. A professor is an expert in the discipline; a librarian can find quality information and help a researcher find it more easily. The Writing and Learning Commons can help students communicate the information and use it ethically by correctly citing sources.

*The Key to Good Research is finding the right source for the right question.*
Service Learning

Service learning provides a great avenue for undergraduate research. At WCU, there are three principal approaches to undergraduate research through service learning: problem-based service learning, community-based research, and participatory action research.

Problem-Based Service Learning (PBSL): Problem-based service learning engages students in seeking solutions to real, community-based problems. Students usually work in teams and relate to the community similar to "consultants" working for a "client." They work with community members to understand a particular community problem or need. This service learning approach presumes that the students will have some knowledge that they can draw upon to formulate and propose authentic, viable solutions to community problems.

Community-Based Research (CBR): In community-based research, students and faculty collaborate with community partners on research projects that address community-identified needs and promote social change. CBR aims not merely to generate knowledge, but also to ensure that knowledge contributes to making a concrete and constructive difference in a community. CBR emphasizes the use of multiple methods of discovery and the dissemination of the knowledge produced.

Participatory Action Research (PAR): Participatory action research has emerged in recent years as a significant methodology for intervention, development, and change within communities and groups. PAR seeks both to understand and to alter the problems generated by a
social system. In this service learning approach, the community indicates the research needs and students bring their research skills to bear on community issues or concerns. With guidance and support from faculty members, students gather, analyze, and interpret data and then report the research results.

The term *community-based participatory research* (CBPR) is also used. CBPR is characterized by authentic partnerships, meaningful community engagement, and community capacity building that combine knowledge with action to achieve social change.

**Benefits of these Approaches**

- Enhanced research skills
- Increased disciplinary knowledge
- Improved knowledge and skills for active citizenship
- Opportunities for collaborative work with faculty and community partners
Service Learning Resources

Research Assistance

Service Learning Center staff members provide research assistance to both students and faculty who request it. Such assistance is typically in the form of library resources (e.g., books, articles, and exemplary syllabi).

Funding Assistance

The Service Learning Center collaborates with other centers and departments of the University to tap sources of monetary and scholarship support for problem-based service learning, community-based research, and participatory action research. In particular, collaboration is designed to identify grant sources, and to prepare and submit proposals to grant-making organizations.

Internships

Service-learning internships provide practical experience in problem-based service learning, community-based research, and participatory action research. Research outcomes might take the form of documentaries, newspaper or magazine articles, oral history segments, feasibility studies, business plans, grant applications, project manuals, or program brochures.

Literature

The Center for Service Learning

828.227.7184

http://www.wcu.edu/9815.asp
Funding Undergraduate Research

Grants at WCU

Finding Grant Funding for Undergraduate Research

Although many research projects require no more than time, a good notebook or computer, and hours in the library, some will inevitably require funding for supplies, travel costs, or other expenses. Although academic departments sometimes have a small amount of money budgeted for undergraduates, The Honors College is a major funding resource. You do not have to be an Honors student to receive undergraduate research funding from The Honors College; funding is open to all full-time undergraduate students at WCU.

Another important source for funding projects may be found in the Office for Undergraduate Studies, headed by Dr. Carol Burton, the Assistant Vice Chancellor for Undergraduate Studies. There is also a wide world of external grant money out there waiting to be used for projects of merit.

Undergraduate Academic Projects Grants

This fund, available between October and March every year, supports student expenses for supplies, equipment, or travel for undergraduate projects.

For more information visit, http://www.wcu.edu/academics/departments-schools-colleges/the-honors-college/ugres/undergraduate-academic-project-grants-program.asp
External Grants

The first place to go to in the quest for grant money is the Research Administration Office at WCU; they must not only approve all external grant money (funding from a source outside of WCU), but they are also the best resource on campus for finding and applying for external grant monies.

External Grant Funding Information from Sources on the Web

   http://www.grants.gov/

2. The Catalog of Federal Domestic Assistance: a database of funding offered by the federal government for any citizen with any need, including students who want to do research.  
   http://www.cfda.gov/

3. The Community of Science: provides not only funding opportunities, but also information and resources for anyone doing any sort of scientific research.  
   http://www.cos.com/

4. Fundsnet Services Online: provides funding information for nearly every discipline.  
   http://www.fundsnetservices.com/

5. Grants Resource Center’s Grant Search: a database of grant money specifically for undergraduate students. It does require a password, as it is a service WCU subscribes to, so go to http://www.wcu.edu/6789.asp for the link to the site, and follow the instructions to receive your login information.

6. GrantsNet: a division of Science magazine dedicated to the funding of research
and training in the sciences.

http://sciencecareers.sciencemag.org/funding?CFID=1123350&CFTOKEN=75550799

Other Scholarships and Grants

- Ford Foundation Predoctoral and Dissertation Fellowships for Minorities: Available to seniors who are US citizens planning to enroll in research-based doctoral programs in a wide variety of fields and are also members of any of the following ethnic groups: Alaskan native, Native American Indian, Black/African American, Mexican American/Chicanos, Native Pacific Islander, or Puerto Rican.  http://national-academies.org/fellowships

- Fulbright Grants: Fulbright Grants are available to graduating students who propose a clear program of study to be carried out in a particular academic setting abroad. The location must be essential to the research project. Fluency in the host language is preferred, and a strong background in American culture and host current events are critical for selection (WCU contact is Dean Brian Railsback at The Honors College, 828.227-7383).  http://www.fulbrightonline.org/us

- National Science Foundation: Three-year graduate research fellowships in science, mathematics, engineering, and social sciences are awarded for study and research leading to master's or doctoral degrees in mathematical, physical, biological, engineering, and behavioral and social sciences, including the history of science and the philosophy of science, and to research-based PhD degrees in science education. The stipend is $14,000 for a twelve-month tenure and tuition
waiver at US institutions. A $1,000 international research travel allowance is also available. Senior/US citizen/US national/Resident alien.

http://www.nsfgrfp.org/

- **Plum Youth Grants**: Plum Youth Grants are given to people under the age of 25 who take action to make a difference and change the world. If your undergraduate research project is of this magnitude, explore this website.

  http://www.dosomething.org/grants

- **GrantsNet**: GrantsNet is a search engine sponsored by the Science Journal. This database contains hundreds of national and international grants that can be discovered by typing in your research topic in the search query. This is a great place to begin looking for grants.

  http://www.grantsnet.org/

- **Organization of American States Scholarship**: The OAS program of scholarship and training assists member states with their efforts in human resource development. The OAS is committed to identifying and implementing strategies for increasing access to higher education. Some OAS scholarships can be used for undergraduate research and graduate study.

Tips for Writing an Undergraduate Research Proposal

Writing a grant proposal for the first time can be as intimidating as writing the research paper itself. However, by following a few suggestions, the process can be fairly straightforward and a good way of ensuring that you have thought out each aspect of the project. Grants should be clear, complete, and concisely written (avoid wordiness or repetition). Be sure to follow the grant guidelines in the RFP (Request for Proposals) very carefully and be sure to work with your faculty advisor! The document should be divided into three main sections with certain sub-sections:

I. Introduction

a. Title Page: student’s information, university’s information, date of request, dates of the project, money requested, etc.

b. Table of Contents (for long proposals)

c. Abstract (brief overview/summary of the proposed project)

d. Introduction: What made you want to do this project? What sort of studies led you to it?

II. Project Description

a. Statement of Need: Should include the problem undertaken and the need for its solution. Why should anyone fund this project? What good will it do? This section usually includes quantitative or qualitative data proving the need for a solution.
b. Goals: Description of what you hope to accomplish.

c. Objectives: More specific than the “goals” section, should include outcomes/results specific to your project.

d. Methodology: Includes an overall description of the methodology of the project, then explains in a detailed way who will be involved, what sort of supplies will be used, and what sort of specific data will be taken and how.

e. Evaluation: How will you know when your project is complete? What will you do with the data you’ve collected? How will you use those numbers to come up with a conclusive result? How will you report these results?

III. Conclusion

a. Future Funding: If the project needs to be continued, how will you pay for it?

b. Dissemination of Results: How will you share your work? (A copy of your final product should be sent to anyone who provides funding for the project.)

c. Facilities and Equipment: If you need any special tools or software programs, etc., how will you get them?

d. Personnel: Who will be the main researchers working on the project and what will they do? If you don’t have everyone, what kind of people do you need and how will you find them? Explain why each member of your team is important, especially if you plan to pay them using funds from the grant.

e. Budget: How will the money be used (itemized)? Toward what exactly is each dollar going? Why is the money necessary?
f. Appendices: Anything important that is either too large for the rest of the proposal or that
doesn’t seem to fit anywhere else; for example, letters of endorsement or support, documentary
material such as maps, graphs, charts, or bibliographies.

Writing Resources

- Writing and Learning Commons
- Hunter Library
- Hunter Library Research Help & Reference
- The Online Writing Lab at Purdue (Owl)
You’ve chosen your research project, and you’re already setting up the cages for the lab mice you need or drafting the questions for your control group of students versus your test group. However, there are certain forms to be filled out and guidelines to be followed if you’re going to use live subjects in any way. While it may be tempting to skip this step, it is the law and it’s there for a reason.

#1: Institutional Review Board (IRB) Approval

In many cases, your procedures must go to the Human Subjects Institutional Review Board before you can begin collecting data. Some examples include (but are not limited too):

- If you’re performing a study in which human volunteers undertake more than minimal risk
- If you’re collecting any bodily samples of hair, fluid, etc. from the volunteers
- If you’re requesting that the volunteers perform moderate physical exercises
- If you’re researching the effects of any drug or chemical on human bodies.
- If you are not sure whether or not you need approval, please ask your faculty advisor and consult the charts at this link:
  
To find out any additional information about the procedures involving human subjects at WCU, visit the IRB website at [http://www.wcu.edu/6801.asp](http://www.wcu.edu/6801.asp). Please keep in mind that this can be an extensive process and requires time, so make sure to plan accordingly. Also, for first time researchers there is a training module that you will need to do to become familiar with the current laws.

### #2: WCU’s Policy on Surveys

If you are planning on surveying a significant portion of the student or faculty body, or if you are doing any surveys in the name of WCU, the survey falls under WCU Policy #51 and must be accepted by the proper authorities.

Visit:  [http://www.wcu.edu/chancellor/index/universitypolicy/policy51.html](http://www.wcu.edu/chancellor/index/universitypolicy/policy51.html)

### #3: Additional Concerns

If your project involves animal testing, the use of recombinant DNA, the use of radioactive materials, or any other potentially dangerous substances, visit [http://www.wcu.edu/6797.asp](http://www.wcu.edu/6797.asp) for more information.

*For more information, contact: WCU Research Administration, 828.227.7212*
Writing the Formal Research Paper

After you have completed your research, you have the opportunity to present it. Aside from posters, the most effective way to do this is through a formal paper. To write a formal research paper, consult the resources provided and follow the four steps described below. Also, keep in mind that plagiarism can result in suspension, expulsion, and the revocation of college credit, so remember to cite your sources correctly.

Writing Resources

- Writing and Learning Commons
- Hunter Library
- Hunter Library Research Help & Reference
- The Online Writing Lab at Purdue (Owl)

I: Thesis Statement

Every paper has to have a thesis statement – a sentence in the introduction of a paper that tells the reader the topic of the paper and the position that the author is taking. Your thesis should cover what your paper will discuss in general terms and be no longer than a sentence or two.

II: Outline

Once you have your thesis, you should make an outline of what your paper will look like. Your paper should have an introduction that tells your reader what he or she will be reading about, a body that contains what you’re writing about, and a conclusion that recaps what you just told
your reader about. Your outline will help you to organize your research into a format that makes it easier to manage. In your outline, you should come up with what you will say in your introduction and conclusion, figure out how many body paragraphs you’ll need, what you’ll put in those body paragraphs, and what order they should go in. It’s important that one item flows into the next smoothly so that your paper doesn’t sound choppy and disjointed.

**III: The Paper**

Once you have your outline done, you can start embellishing it to make your actual paper. Put everything into that recognizable essay format while watching your grammar and following the citation style appropriate to your discipline (e.g. MLA, APA, Chicago, etc.) The style varies from discipline to discipline, and each style is unique in terms of stylistic details as well as citation format. If you aren’t sure what style your discipline uses, talk to your advisor or someone in your department.

**IV: Revision**

Once you finish your paper, review it several times and look for problems – unnecessary information, grammatical errors, and other such mistakes. It’s recommended that you put your paper aside for a while before editing it, as it’s easier to spot mistakes if you don’t think about the paper extensively before you go back over it. You can also ask other people to read it; anyone else can spot mistakes and places where an idea is unclear. Reading your paper aloud to yourself is also a good proofreading tactic – if something is hard to say, it will be harder to read, and you’ll hear mistakes you didn’t catch while reading it silently.
Presenting Your Research

Expo 2014

The Honors College sponsors a two-day, campus-wide Expo featuring the research, creative work, and service of undergraduates from a variety of fields and majors.

The 2014 Expo will be held Monday-Tuesday, March 24-25, 2014.

How to Register

Work with a faculty/staff sponsor to complete and e-submit the online form to Bonnie Beam in The Honors College. For more information on the Expo, call 828.227.7383.

Deadline for Registration is 5pm Friday, March 7, 2014.

The National Conference on Undergraduate Research (NCUR)

The National Conference is the premier undergraduate research event in the US, with students in every major presenting their work from over 300 universities. For all WCU students who submit abstracts that are accepted for the conference, The Honors College will pay for travel, lodging, and registration (students are responsible for food, though lunch is included in the conference registration). For more information, call the Honors Office at 828.227.7383 or review the NCUR website, www.ncur.org.