

Undergraduate Research Across the Curriculum: College of Arts and Sciences

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The Winthrop University College of Arts and Science Undergraduate Research Advisory Committee asked representatives of each department in the College to describe what efforts, if any, each took to incorporate research into its undergraduate major curriculum. The committee then used the department responses to identify clear patterns in the College and group their efforts into a set of models that can be used to assess the amount and types of student research across the curriculum. We summarize the extent to which the models apply to the various College departments in the attached spreadsheet.

First, given the diversity of departments in the College of Arts and Sciences, we determined that some disciplines prefer the term “scholarship” and others “research.” In this analysis, we use these terms interchangeably to refer to any efforts by which faculty and/or students generate new knowledge in a field of study. This new knowledge may use the scientific method, close textual analysis of works of literature, creation of new art forms (such as poetry), and other recognized approaches.

Second, we discerned from our study of the curriculum, that departments typically incorporate scholarship into their curricula in three ways. Third, we attempted to define particular student learning outcomes for each of the three models. They are:

Skill Level Training: These two categories would not necessarily be considered undergraduate research experiences, but provide evidence of the fact that research skills are built over time and across courses. They also offer recognition to faculty across departments who engage students in research to some degree through their courses and/or support research training within their discipline.

Skill Level Training 1 (S1):

Definition: In many departments, students are introduced to the skills required for the specific types of research (textually-based scholarship or empirical research) expected of that field/major in 100 or 200-level classes. This early introduction precedes and is less extensive than the coverage in classes devoted solely to methodology (Model 1).

Examples of Student Artifacts/Learning Outcomes: These are usually lower level classes in which information about research methods (e.g., literature searches, critical thinking about sources, investigating databases, research design, and ethics in research) is introduced to students. Students may practice research techniques under the close guidance of the faculty member; however, the products would not qualify as independent works of research. The professor may be doing a significant amount of the work (structuring the research opportunity, demonstrating techniques, modeling appropriate strategies, providing specific formats, discussing ethical ways to use animals and/or humans in research, etc.).

Skill Level Training (S2):

Definition: As students progress through their major, research skills will be practiced and refined over time as students gain content knowledge, a necessary grounding for undergraduate research. Students may apply their research training to specific content areas within their discipline, without their research efforts being the primary focus of the course.

Examples of Student Artifacts/Learning Outcomes: These are typically upper-level courses, following students' exposure to research training. The goal of the course is to teach students about specific content information, with students given the opportunity to apply research techniques to the topic of the course. In other words, research may be a component of the course, but not the primary focus of the course. In addition, the focus is on using research to illuminate course content, not on training students how to do research. However, at least 25% of the course focus and/or course grading should be associated with some type of research project (research paper, data collection) in order to be included in this category.

Models of Undergraduate Research: The three models described below are equally important ways undergraduate research is incorporated into the curriculum. The different approaches reflect the diversity of scholarship and mentoring methods practiced by the various disciplines. In addition to research methodology the faculty mentors introduce students to the ethical standards of their disciplines including, if appropriate, the proper use of animals and humans in research.

Model 1: Institutionalized Courses (Research Method Courses) (M1).

Definition: A course is institutionalized in the curriculum to teach discipline-specific research methods and skills through applied scholarship. In many disciplines these courses are required of all majors, and sometimes occur early in the student's career, or are pre-requisites to more advanced study.

Example Courses: method courses SOCL 316/516, BIOL 300, ENGL 500, PSYC 301/302

Examples of Student Artifacts: Student projects may be presented at course-, departmental- or college-wide research colloquium; students may work independently or in groups and are listed as authors. In some departments students may present their work at professional meetings or continue the work originated in class as the focus of independent senior research/scholarship projects. Student artifacts may contribute to a faculty-directed research/scholarly initiative.

Student Learning Outcomes: Students will understand the distinction between primary and secondary sources, and existing scholarly knowledge and generating new knowledge. They will also understand issues related to conducting original research or scholarship

relevant to each discipline, understand the steps involved in creating new knowledge relevant to each discipline and understand the discipline's standards for judging the quality of the new knowledge generated.

Challenges: Often the sophistication of student scholarship required for the course may be less than what is required for presentation at a professional meeting. Thus, one challenge inherent in this model two questions. The first is who will mentor promising students to help them revise their projects to the level required for presentation? This is of particular concern when faculty members teaching the courses have to mentor students on projects that may be outside of their immediate research interests. And secondly, how should such faculty members be compensated? One possible solution is to allow students to enroll in an advanced research course – either a required course or an elective – which could be taught in-load by an interested faculty member.

Model 2: Student-Driven Projects (M2):

Definition: Students may generate scholarly projects that may or may not be course embedded. However, when conducted in an individual course, the primary goal of the course is not to provide instruction in the scholarly/research method (i.e., student-generated research is incidental to the primary objective of the course). Students may present their work in class, in a departmental colloquium, or a professional conference. The student will likely be the first or sole author on publication/presentation artifacts. The student projects may also provide “capstone” experiences for upper-level students.

Example Courses: 450 honors courses, PSYC 471/472

Examples of Student Artifacts:

Student projects may be presented at course-, departmental- or college-wide research colloquium, and some students may use the work as an honors thesis or independent senior research/scholarship project. Students may make presentations at national, regional, state or local venues. In some departments students may present their work at professional meetings, or submit the work for publication in peer-reviewed professional journals.

Student Learning Outcomes: Students will learn how to apply concepts and process of generating new knowledge to the content of a specific course. They will build off of existing literature (secondary sources) and develop a scholarly project relevant to the content of the course.

Challenges: This approach offers substantial promise, particularly in those disciplines that require a research/scholarly methods course early in a student's career. However, faculty need to communicate clearly to students that such writing projects are acceptable, and even encouraged, in the context of the course. Yet only faculty who are disposed to cultivating a culture of student research are likely to encourage students to attempt such projects.

Moreover, mentoring students interested in taking on such a project -- and developing a product worthy of presentation at a conference -- may go beyond the temporal confines of the course, leading again to questions of compensation and faculty teaching load.

Model 3: Faculty-Student Collaborations (M3):

Definition: The third model is when faculty members collaborate with students on a research project, usually initiated and conceptualized by the faculty member. Faculty members choose students based on their interest and abilities, and students may get course credit as an independent research course. Students are involved in various aspects of the research process, such as collecting library materials for background, examining documents, conducting interviews, designing surveys and/or collecting and analyzing data, as appropriate. Students may also participate in writing some of the final product, and are probably listed as co-authors, with the faculty member as first author.

Example Courses:

Independent research courses like BIOL 471/472, CHEM551/552, PSYC 471/472, and 450 Honors courses in each department.

Examples of Student Artifacts:

The work conducted by students often results in new knowledge that can be/is presented in professional venues (publications/presentations). Honors theses, peer-reviewed publications, intra-institutional presentations (course, college, and university), presentations at external professional/UR-oriented meetings. Students are likely to be listed as a co-authors rather than first author.

Student Learning Outcomes: Students will participate in all aspects of the research/scholarly process with a faculty member. Students will understand how the components of the research/scholarly process are used by scholars in the discipline to create new knowledge that is judged by one's peers to be original and of high quality.

Challenges: Again, the question of how to compensate faculty members arises, in addition to how to ensure that students may receive academic credit for such collaborations. One obvious approach is that the department may create a course specifically for such collaborations. Political Science's PLSC 501, 502 and 503 sequence is one example. Faculty members may receive compensation through accumulated teaching credit hours or as in-kind compensation for the unpaid assistance of one of more able undergraduates.

The Committee on Undergraduate Research hopes that these models will lead to more conversations about how to incorporate undergraduate research across the curriculum, and additional involvement in undergraduate research by individual faculty members and at the department level.