Undergraduate Research

IUPUI HIGH-IMPACT PRACTICE TAXONOMY

Description

Undergraduate research is defined by the Council on Undergraduate Research (CUR) as an inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline. Undergraduate research is recognized as a high-impact educational practice (Kuh, 2008), and its many benefits include gains in student learning (e.g., making use of primary literature, formulating research questions, logical and creative thinking) and personal gains (e.g., increased ability to work independently and greater tolerance for obstacles).

Research-supportive curricula

- Provide students with training in the tools and methodology of the discipline;
- Are designed to scaffold undergraduate research experiences, such that early curricular experiences provide students with the transferable skills to subsequently undertake high-level scholarly projects;
- Impress upon students the value of understanding methods and research results, noting that students undertaking scholarly work must be prepared to read and interpret primary literature.

Purpose

1. Provide a resource for program leaders to develop and maintain a research-based curriculum by
    a. Identifying the key attributes essential for maximizing the UG research experience at various stages of student learning
    b. Encouraging program leaders to augment the depth and intensity of their program design for each attribute by providing appropriate learning tools
2. Provide highest-quality learning experiences for students who want to engage in research

ABOUT IUPUI TAXONOMIES

The IUPUI high-impact practice taxonomies support instructors in the iterative development and improvement of courses that engage students in active learning.

Download all of the taxonomies at scholarworks.iupui.edu/handle/1805/21503.

Levels of Impact

ATTRIBUTE	HIGH IMPACT	HIGHER IMPACT	HIGHEST IMPACT
The course instructor is well qualified (Knowledge, Experience)	Expertise on the subject matter; hands-on research experience not required	Expertise on subject matter; some experience conducting research with UG students	Use of multiple faculty mentors in addition to the course director; all individuals have expertise and experience conducting peer-reviewed research for many years as well as student research mentoring
The teaching method(s) and course content should be aligned with student skill level	Lecture-based teaching plus interactive small group learning: problem-based learning (PBL) and/or project-based learning. Attendance of local research conferences and symposia. Teaching content may include: literature review, research methodology, data management, ethics and compliance, research history	Lecture-based teaching plus some limited non-classroom independent research experience mostly in a team setting (lab project, field project etc). Attendance of local research conferences and symposia. Teaching content: as in previous rubric	Some classroom but mostly independent research activity with faculty mentor(s) including but not limited to team-based research. Teaching content: as in previous rubric but mostly in form of a quick refresher
Applied learning (application of current knowledge) is an essential component of research	Instructor selects research papers and provides assignments related to content; development of research questions and hypotheses related to assigned team-based projects.	Students draft a simple research study on an assigned topic following an independent literature review.	Drafting of an independent research study to fill a knowledge gap followed by completion of the research project.
Integration of critical and creative thinking is an essential component of research (interpret and evaluate information/data; solve problems; draw appropriate conclusions)	Critical thinking skills are learned through various activities assigned by instructor such as: • Evaluation of current published research in the field. • Working through PBL cases and/or team-based project assignments. • Assignments associated with attendance of local research conferences and symposia.	Critical thinking skills are improved through independent literature review and identification of knowledge gaps in the discipline.	The student is expected to: • Analyze and interpret data from own research project • Consider alternative explanations of data; • Identify potential challenges in the research project and address them
Development of oral and written communication skills are integrated into the course	Facilitated in-class discussion and take home assignments (e.g. group discussion of research papers; drafting of literature summary reports); oral and written reports of outcome of team-based projects	Writing assignments (e.g. draft of a research study proposal); oral presentation of a paper to classmates with subsequent class discussion	Poster, oral presentations, exhibitions, and/or public performances at local, regional or national venues; drafting of manuscripts for publication

Critical reflection is well integrated into student learning	The instructor provides a detailed and structured template to facilitate students' reflection on their learning experience; only short answers are expected	The instructor provides limited guidance to encourage student reflection on the learning experience; some student self-assessment is expected.	The instructor requires students to critically reflect on the research experience and explore its relevance to academic content, personal growth and career aspirations. Students are expected to link the research experience to IUPUI's PULs. Cross-disciplinary reflection is required when appropriate (interdisciplinary projects).
Assessment is used to monitor student learning and make course improvements	Student learning and skill acquisition are assessed at the end of the learning unit	Student learning and skill acquisition are assessed more than once. A final paper is required in the form of a short research proposal draft.	Student learning and skill acquisition are assessed multiple times throughout the course. Students receive continued feedback. The completion of multiple research reports and a final report are required.

References

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