Preparing students to engage with ‘the big picture’ of learning: How to build team-based undergraduate research opportunities into undergraduate courses

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Many educators would like to add undergraduate research opportunities to courses, but they don’t know where to begin or have had an unsuccessful experience. A thoughtful strategy is needed to align a proposed research plan with the subject, the course, and with student needs and interests to create a quality High-Impact Practice experience. I have conducted team-based undergraduate research in different classes over 11 years; this work has resulted in a series of journal articles and publications. Based on my experience, I’ve come up with a set of 12 strategic guidelines for building research opportunities into undergraduate classes. The guidelines help assure that the proposed research plan is relevant, rigorous, yet simple enough for undergraduates to participate in and meaningfully learn from. Following the recommended steps can help educators build undergraduate research into any course, to boost student engagement and learning. The added bonus, of course, is that the faculty member leading the class can add to his/her record of publication as a result of the collaborative work with students.

Strategic guidelines:

1. The research project must be something relevant enough to warrant the effort, complex enough to potentially lead to scholarly publication, but simple enough to explain and systematically conduct with undergraduates.
2. The research project must be undertaken in a way that students can have autonomy, but the faculty member can review every aspect of students’ work.
3. The research topic must be something students find relevant and fun.
4. The research topic must be seen by students as relevant beyond the subject and course.
5. The research topic and methods must be seen by students relevant within the course.
6. Methods of inquiry must be complex enough to gather valuable data.
7. Methods of inquiry must be simple enough for undergraduates to understand and carry out.
8. Data collection must be simple enough for students to conduct with minimal error.
9. Data collection must involve simple, structured tasks with specific deadlines and grades.
10. Having students work in teams in a parallel effort allows opportunities for mentoring, comparison of findings, and drawing of conclusions.
11. Having students work in teams in a parallel effort allows the faculty member to merge findings into a cohesive whole.
12. Students should be able to see the output of their team and others, to bring the effort ‘full circle.’
Examples of published work that began with undergraduate research in my classes:


