

A Research-Infused Undergraduate Music Curriculum

Gregory Young, *Montana State University*
Gary W. Don, *University of Wisconsin–Eau Claire*
Alan Rieck, *Pennsylvania State University*

Abstract

As music programs at colleges and universities join the undergraduate research movement, many faculty and administrators may be unsure of terminology, educational practices, or ways to combine some of the creative aspects of music degree requirements into compelling undergraduate research projects. One of the biggest challenges is embedding undergraduate research and creative activity (URSCA) into the curriculum so that more students experience it without placing additional burdens on faculty. This article offers examples within the music degree and general education requirements at two universities that might serve as models. They range from freshman year to senior capstone projects, offering students inspiring and active learning experiences that will enhance their engagement with the subject matter and link their learning with the discovery of knowledge and art.

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Music has been one of the last disciplines to embrace undergraduate research (UR), as many instructors across the country either do not know about the growing undergraduate research activity nationally or are reluctant to join in. Many others are mentoring undergraduate research but simply not labeling it as such. Still others have not combined the various elements of student creativity into projects that could be recognized as research. This article describes several efforts at Montana State University (MSU) and the University of Wisconsin–Eau Claire

(UWEC), offering suggestions that could be applied at other institutions. URSCA is a requirement in general education at the former and a path to general education at the latter institution.

Terminology

The Council on Undergraduate Research (CUR 2017) defines undergraduate research as follows: “An inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline.” Reactions to this definition by faculty members in music have included the following:

1. “My students are not prepared to make an original intellectual or creative contribution to the discipline”;
2. “I am too busy teaching the basics to mentor students in this way”; and
3. “Undergraduate research is something that works better in the sciences” or, conversely, “Everything we do in music is a creative activity.”

One way to think about the definition of UR for music is what a music department might recommend if asked for student submissions in a campus-wide undergraduate research/creativity symposium. They would likely recommend the best original student projects from courses or independent studies that bring recognition to the music department. It could be an original composition, an exemplary final paper for a music history seminar, a survey of community music participation, or examples that will be discussed later in this article. Celebrations of student work are almost ubiquitous now at colleges and universities across the United States, and it is in the best interest of every music unit to participate as fully as possible.

Ultimately the research and creative process is the inquisitive and disciplined pursuit of answers to a particular question. Too frequently research is viewed as the acquisition of knowledge rather than as a process through which assumptions and possibilities are questioned and explored so as to reveal, reaffirm, or call into question what one thinks is already known. When a relevant question guides inquiry, scientists and artists are empowered to make meaningful connections that are more easily integrated into the greater scheme of knowledge and understanding. Artistically, these questions regularly explore the realities and possibilities of human experience. What does it mean to experience loss? How does one express the realities of joy to others? What impact does cultural context have on the manner of expression of its constituents?

A prerequisite for adopting UR fully into the curriculum is to ensure that all, or most, faculty members in the department or school are on board. This could be introduced as part of strategic planning; be incorporated into the vision and mission statements; be the goal of the curriculum committee, or all of the above. Scaffolding UR so that students are exposed to the concepts in freshman seminar, experience it in some way in most music courses and in the general education component, and finish with a senior project focused on UR would constitute a research-infused curriculum.

Embedding Undergraduate Research in the Music Curriculum

The music major seminar at the MSU School of Music is a weekly zero-credit offering that complements the standard concert attendance requirement. In this seminar, faculty and others present their research in an interactive way, with plenty of time for questions and answers. Students would learn, from the beginning of their degree programs, that professors do more than just teach and that universities are often the leading generator of new knowledge, including music composition. An example played out in this music major seminar in January 2016. The clarinet professor (Young) was planning the fall recital "The Clarinet in Rare Contexts" and led a collaborative composition session with a didgeridoo player (from the science faculty), and an undergraduate percussionist. After demonstrating the traditional possibilities on each instrument, the players asked the music majors in the audience for ideas for innovative sound-making, themes and structures for a composition, ways to start the piece, and so forth. The result was a four-movement sketch with the following spontaneous working titles:

- I. Sunrise Sounds,
- II. The Wild Jungle,
- III. Conflict, and
- IV. Sunset Serenity.

Students suggested singing into the clarinet while playing, emitting primitive screams into the bottom of the djembe,

and rubbing the didgeridoo ribs with a stick, as well as offered other wild ideas that have yet to be refined. The session provided a fun way to spend an hour with the music majors, insight into uninhibited creativity, and some great compositional ideas.

In most courses, music professors could spend part of their instructional time or provide an assignment that involves passing on new research relevant to the course material. At first glance, this activity may seem unrealistic, but with a little creativity, it can be done. For example, in woodwind methods classes, the professor could introduce new research about reeds and even have students collect empirical data on the sounds of different reeds. Applied music instructors could have students bring in discussion topics from the latest instrument-based publications or web resources. Millennial students especially appreciate knowing that they are up-to-date with the latest knowledge in their studies.

Undergraduate Research in General Education

A robust general education program should have inquiry, undergraduate research, and the discovery of knowledge as major foci. The "Core 2.0" general education program at MSU requires its 14,000 undergraduate students to choose and complete four inquiry courses and a research/creative experience course. At UWEC, an integrative learning (IL) component recently was implemented as part of the university's liberal education requirement that is replacing its general education requirement. Integrative learning offers opportunities for scaffolding undergraduate research as part of regular coursework. The IL rubric has three benchmarks:

1. [Each] student demonstrates a developing sense of self as a learner by connecting academic knowledge to [his/her] own experiences;
2. [Each] student makes connections across disciplines; and
3. [Each] student applies skills, knowledge, or methodologies gained in one academic or experiential context to a different academic or experiential context.

The UWEC Department of Music and Theatre Arts proposes that students can meet the three IL rubric requirements by developing research questions that they pursue over the course of three or more separate classes. The connections among the students' experiences in these different contexts combine to satisfy the three rubric requirements. For example, a student may ask how Mozart developed real characters in his operas. This student, who may be performing a role in a Mozart opera, can analyze the melodic, harmonic, and formal aspects of the arias that he or she is performing in a music theory class. The broader context of gender roles, operatic conventions, and the social context for the opera can be examined in a music history course. The student can then use this knowledge

to shape his or her performance of the role in the opera, thus “connecting academic knowledge to [his or her] own experiences” and demonstrating the connection of these areas in the development of the character in performance. The student’s research thus fits into existing courses and the workload of the faculty member, without additional demands on faculty time.

Interdisciplinarity

Electives that offer interdisciplinary perspectives on research at MSU have included seminars on music and architecture, music and economics, and music and the brain. Although these are more difficult to fit into existing faculty workloads, they can help propel faculty research due to the likelihood of resulting publications and might be eligible for funding from an honors program or other strategic initiative from the institution. These interdisciplinary student-faculty research projects can address faculty concerns about the difficulty inherent in identifying projects that are appropriate for undergraduate students, because they do not require disciplinary knowledge and skills at the doctoral level. The students can contribute knowledge from different disciplines to the project that might not be known by the faculty member. In this way, the students are genuine collaborators. One example from UWEC is a music-mathematics project examining sound synthesis of fractal shapes. The faculty member (Don) contributed knowledge of sound synthesis tools such as C Sound, and the student contributed knowledge of affine transformations and mathematics tools such as Matlab. By combining and connecting their knowledge and skills acquired from different disciplines, the researchers were able to explore the analogies between visual and sonic shapes in new ways. The initial results of the research were presented at the National Conference of Undergraduate Research (NCUR), but the value of the research extended far beyond that venue. It led to collaborations between faculty and students in music and mathematics, resulting in a book and numerous student-faculty summer research projects based on other connections between music and mathematics (Walker and Don 2013).

Community-based research projects, whether as paid internships or credit-bearing independent studies, fit naturally within a research-infused music program. Examples include a business major working on marketing research for the local symphony; innovative event planning for a community arts organization; surveying the participants in community music lesson programs; or researching the relationships between music and memory at an elder care facility. Even study abroad can afford students the opportunity to conduct research, and funding from a central university research office for the project could help offset travel costs for students. Very often, music students are the least likely to apply for central funding available to students for research, but most central office UR personnel strive to have a wide representation of disciplines.

One faculty member (Young) gave an assignment to students in a leadership seminar that involved reading a publication by an MSU professor on any subject of interest, calling the professor, and requesting a 15-minute interview. Students then wrote a short paper encompassing the interview and the professor’s research and created a five-minute presentation on it for class. Professors were delighted that these students were reading their publications and happy to discuss their research with them. The learning outcomes associated with this small project involved performing a literature search, technical reading, gaining the confidence to call a professor and interview him or her, writing about the experience, and presenting to peers. One observation was that students had little prior knowledge of the roles of professors outside of teaching. Such an activity can assist in creating an educated citizenry who not only vote but also become future leaders in the community and beyond.

Senior Capstone

The required senior capstone project at MSU is taught by Young and is structured as a collection of undergraduate research projects mentored by the instructor with or without additional mentoring by professors interested in the particular topics. These can be independent projects or small parts of a professor’s research in which the student acts as a research assistant. Examples of independent projects include the following:

1. Nicole Jerominski Krause built a small marimba using only leftover materials from a building construction site, documented this project on video, and presented her findings—and the marimba—at NCUR; and
2. Anthony Gaglia spent time in Haiti, decided to research Haitian musical genres, and composed an original piece for five guitars.

Examples of work involving a professor’s research include the following:

1. Samantha Tschida worked on a research project with Young surveying students and faculty about the benefits of learning to perform from memory. The resulting article was published in a national journal (Young 2003) and reprinted in two German journals (Young 2004, 2006); and
2. Madison Gabig interviewed faculty members from music and other disciplines about teaching creativity. Her work is part of a book chapter currently in press (Young, forthcoming).

Even though faculty workload issues are perhaps the toughest to work out in the transition to a research-infused music curriculum, a little creativity paired with the knowledge that students will benefit can reap great rewards. Students will realize that they can pursue a modern degree centered on their interests and linked to the creation of knowledge and art, and will be better prepared to adapt to real-life situations after graduation.

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Gregory Young

Montana State University, gyoung@montana.edu

Gregory Young is a professor of music theory and clarinet at Montana State University where he was vice provost for undergraduate education for eight years and founding director of the Undergraduate Scholars Program. He supervised the implementation of a new core curriculum that was one of the first at a public university to require undergraduate research/creativity. Young often publishes with undergraduate coauthors and has given invited talks in Italy, Spain, and the United States on correlations between music and architecture. He is a former treasurer and chair of the National Conferences on Undergraduate Research. He serves as a councilor in the Arts & Humanities division of CUR and as a member of the steering committee for the British Conference of Undergraduate Research.

Gary W. Don is a professor of music theory at the University of Wisconsin–Eau Claire. He teaches second-year written theory and aural skills, as well as upper-division theory courses. He also sponsors independent and collaborative student research projects. He holds a doctorate in music theory from the University of Washington, and he taught theory and aural skills at Skidmore College before joining the UWEC faculty. His research interests include overtone structures in the music of Debussy, modality in the music of Prokofiev, and theory pedagogy. He has presented papers on these topics at the West Coast Conference of Theory and Analysis, Music Theory Midwest, the Great Lakes Chapter and national conferences of the College Music Society, and national meetings of the Society for Music Theory. He has published articles in Computer Music Journal, In Theory Only, Perspectives of New Music, Music Theory Spectrum, and Musical Insights, as well as an essay in Analyzing the Music of Living Composers (and Others), Cambridge Scholars Publishing.


Alan Rieck is assistant vice president and assistant dean for undergraduate education at Penn State University. He is a member of the leadership team in the Office of Undergraduate Education that provides collaborative direction and coordination for university-wide programs and initiatives in support of undergraduate teaching, learning, and enrollments at Penn State. His responsibilities include leadership and administration of undergraduate research and other program initiatives, collaboration and coordination for university groups and initiatives concerned with undergraduate education issues, leadership and coordination for strategic planning in undergraduate education, and oversight for undergraduate education communications. Rieck was previously professor of choral music and music education as well as chair of the UWEC Department of Music and Theatre Arts.

Clarinet Tips

Dr. Gregory Young
Professor, School of Music
Montana State University-Bozeman
www.montana.edu/music
gyoung@montana.edu
406-570-9664

1. Make sure your daily practice includes the following:
 - ✓ Tone exercises, *pp - ff - pp*
 - ✓ finger yoga*
 - ✓ scales, played mindfully
 - ✓ tonguing, with as little mouth movement as possible
2. Fingers should all be slightly curved, with no locked knuckles. They don't need to move very far. Most clarinet students use too much finger motion.
3. The tongue should also move only a tiny distance. Whether playing loud or soft tongued passages, the tongue need only move an eighth of an inch and touch the reed very lightly.
4. Practice slurring softly into the high register so you get used to voicing the notes properly. Voicing is the positioning of the tongue and oral cavity to most efficiently produce the correct pitch.
5. A quick way to form the perfect embouchure is to pretend you are drinking a cold, thick milkshake and your thumb is the straw. Look in the mirror to see that your chin muscles are pointed down. When playing clarinet, use more top lip pressure and have the top teeth rest gently on the top of the mouthpiece.

* Finger Yoga



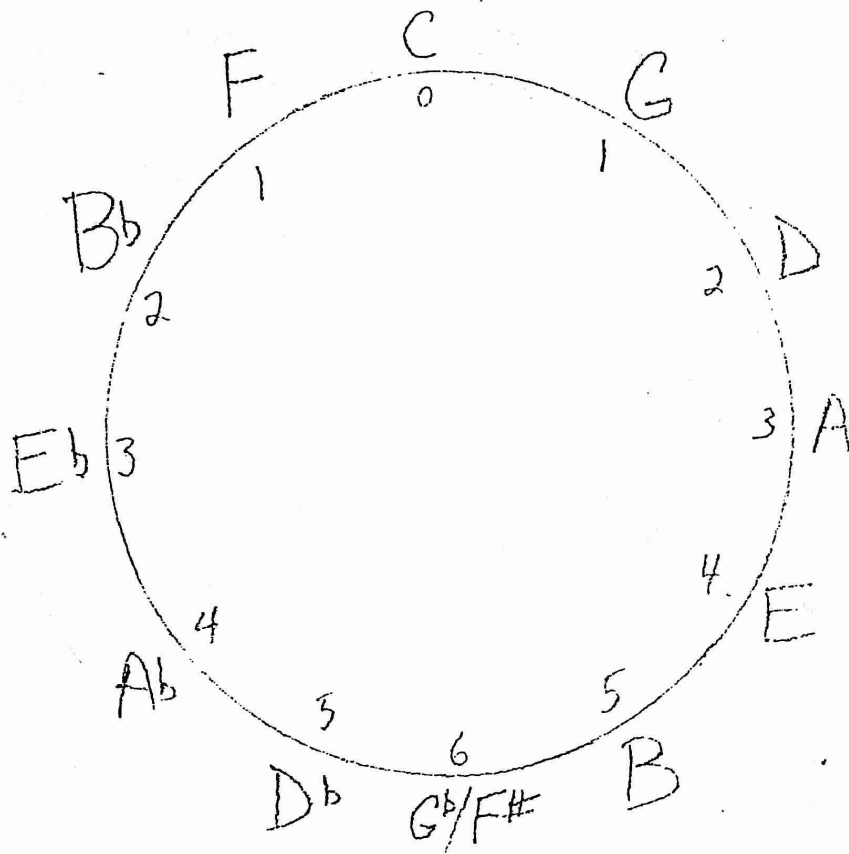
A musical staff in 2/4 time showing a sequence of eighth-note patterns. The first pattern is a descending eighth-note scale from G4 to D4. The second pattern is an ascending eighth-note scale from D4 to G4. The third pattern is a descending eighth-note scale from G4 to D4. The fourth pattern is an ascending eighth-note scale from D4 to G4. Each pattern is bracketed and labeled '2x'. The sequence ends with 'etc'.

Continue this sequence all the way up to the top of your range.



A musical staff in 2/4 time showing a sequence of eighth-note patterns. The first pattern is an ascending eighth-note scale from D4 to G4. The second pattern is a descending eighth-note scale from G4 to D4. The third pattern is an ascending eighth-note scale from D4 to G4. Each pattern is bracketed and labeled '1'. The sequence ends with 'etc'.

Continue this pattern all the way to the top of your range



Play in all 12 keys (or as many as you can)

