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<th>Proposal Title:</th>
<th>New Tools for Musicianship and Theory Pedagogy</th>
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<td>Investigators:</td>
<td>Matthew Arndt</td>
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<td>Org Unit:</td>
<td>College of Liberal Arts &amp; Sciences</td>
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<td>Department(s):</td>
<td>School of Music</td>
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<td>Funding Awarded:</td>
<td>$5,000</td>
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Musicianship and Theory I–IV is a foundational, gateway sequence for all music majors that has a high attrition rate, here and elsewhere. It is analogous to gateway courses in mathematics and the hard sciences, with one difference: prior to the nineteenth century, most of the relevant skills were already mastered by schoolchildren. Why is it so difficult now? Two teaching and learning challenges present themselves:

(1) in the eighteenth century, court musicians learned musicianship and theory by mastering the keyboard through one-on-one instruction over several years from an early age, but modern theory pedagogy takes place in large college classes with one piano, typically over two years, and

(2) traditional concert, church, and chamber music is essentially a foreign language to most students today.

Like foreign language acquisition, aural skills acquisition depends on discriminating minimally different stimuli, but current learning materials do not necessarily facilitate this discrimination. I propose to meet these challenges in two ways:

(1) having students record keyboard exercises at the new computer lab for the School of Music and submit them for individual feedback, using a program called SmartMusic, and

(2) having students use electronic flash cards that allow them to focus on discriminating minimally different stimuli, using a free app called Anki.

This app allows this focus by using the principles of active recall and spaced repetition for maximally efficient learning. By way of contrast, the commercial program I currently use for aural identification, MacGamut, simply chooses exercises at random; it also has an awkward interface, and it is not mobile ready. Keyboard exercises using SmartMusic have been used successfully by Michael Callahan at Michigan State University for a few years, and I have been conferring with him about how to implement them. Over the
course of the Spring 2016 semester, a student mentee will translate and adapt existing written harmony exercises—for example, harmonizing a melody—into SmartMusic exercises. Please see the sample SmartMusic assignment in the supporting document. My mentee will also transform existing aural identification exercises for use with MacGamut—for example, identifying the notes of a melody—into Anki flash cards, which can include both aural identification and singing exercises.

During the summer, I will make short videos to guide students in using the programs. I intend to implement the SmartMusic exercises and Anki flash cards in lieu of MacGamut in Fall 2016. My theory colleagues at the University of Iowa School of Music share my concerns, and they are also interested in SmartMusic and alternatives to MacGamut. The project has the potential to improve matriculation rates for all incoming undergraduate music students, currently about 50 per year.

The learning goals for the Musicianship and Theory sequence are to:

- Recognize and produce musical patterns in sound and notation fluently,
- Recognize basic structural and expressive features of music in different styles,
- Be more reflective, expressive, efficient, and confident in making music, and
- Connect more deeply with eighteenth- to twenty-first-century music.

The corresponding learning objectives addressed by this project are to:

- Create multi-voice musical passages using traditional idioms, and
- To hear, remember, understand, and notate melodic, rhythmic, and harmonic patterns.

In addition to meeting the challenges described above, students will be more engaged, bridging more directly from these objectives to the broader goals, by actually making music instead of just representing it on paper, which also facilitates self-correction. Their learning will also be more individualized by using (1) keyboard exercises with different options depending on their technical facility and (2) aural identification and singing exercises that are tailored to their needs through the spacing of repetition. Professor Callahan at Michigan State has found that the vast majority of his students produce high quality work with SmartMusic exercises, in contrast to the situation with analogous written work, and that most students find SmartMusic exercises helpful, because of:

- Improved musicianship through recognition and production of musical patterns in composition, performance, and listening,
- Increased self-efficacy and confidence, and
- Increased enjoyment and excitement with the material.
It is noteworthy that these benefits are three of my learning goals for Musicianship and Theory. I will assess the impact of the technology through (1) comparison of grades for students before and after implementing SmartMusic and Anki, (2) comparison of student ratings for how the course was relevant or challenged them to think, (3) identification of themes in student comments about the tools, and (4) evaluation of student Likert ratings of the following statements:

- SmartMusic exercises help me recognize and produce musical patterns.
- I feel more efficient and confident as a musician because of SmartMusic exercises.
- I feel more engaged with Western art music because of SmartMusic exercises.
- SmartMusic is convenient and easy to use.
- Anki exercises help me recognize and produce musical patterns.
- Anki is convenient and easy to use.

I ask for funding to hire Kati Meyer, a doctoral student mentee who will translate and adapt existing materials to SmartMusic and Anki under my guidance. Like me, she has a research interest in making music theory more accessible to more students, and she is enthusiastic about the project. Both programs are user friendly, and training Kati will go quickly. I also ask for funding for 25 SmartMusic USB Vocal Headphone/Microphones. The headphone/microphones are needed to hear the keyboard and to sing or talk along with it (in one kind of exercise, students narrate what is happening in the music). New keyboards are already being acquired for the new School of Music computer lab at great expense, so the project can be implemented for a relatively small cost.

I estimate that the cost will be $5000. Translating and adapting the harmony exercises will take approximately 120 hours (2 hours per week of classes x 15 weeks per semester x 4 semesters), and translating and adapting the aural identification exercises will take approximately 40 hours (2.5 hours per unit x 4 units per semester x 4 semesters). My mentee will require $25 per hour or $4000 for 160 hours. The headphone/microphones cost $40 each x 25 = $1000. I am also applying for an Instructional Improvement Award, which could cover the cost of hiring my mentee.

**Supporting document(s):**

- FY16-ITTA-Arndt-Supporting-Document.docx

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