

# Technology's Role in Achieving Creativity, Diversity, and Integration in the Undergraduate Music Curriculum

Peter Webster & David Williams

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For this handout and presentation slides: [www.peterrwebster.com](http://www.peterrwebster.com)

**Table 1: Historical Categories/Instructional Context/Competencies**

	Computer-Based Instruction	Interactive Media	Electronic Keyboards	Notation	Recording Listening	Creativity Tools	Social Networking Tools
Theory Composition Orchestration Arranging	6 9		7 8 9	1	2	3	11
Performance Improvisation Lessons/Recitals/ Ensembles	7	5	7 8 9 C	1	2 3 4	5 6 D	5 6
Music History World Music	6 E	5 F		1	3	5	5
Community Engagement/ Outreach Entrepreneurship		5 6		1	5 6 G	5 6 H	10 11
General Studies Interdisciplinary Studies	8	5 6 7	7	1	2 3 4 I	1 3 5 6 J	10 11
Technology Teaching/Learning Pedagogy	8 9	5 6 7 K	7 8	1 L	2 3 4	1 3 5 6	10 11 M
Final Capstone Experience	8 9	5 6 7 N	7 8	1	2 3 4	1 3 5 6	10 11 O

Note. Numbers refer to the eleven competencies noted below. Letters refer to the scenarios described.

1. Enter and edit music using notation software
2. Understand the basics of digital audio and how to edit digital audio files
3. Record and mix a performance with digital audio software
4. Demonstrate an understanding of copyright and fair use
5. Create a music presentation with production software and appropriate hardware
6. Create a streaming audio file (sharing recordings)
7. Demonstrate an understanding of MIDI and its applications including performing with electronic, digital, and non-traditional instruments
8. Demonstrate setting up a computer music workstation/problem solve technical issues
9. Demonstrate an understanding of acoustics and audiology
10. Create and edit a simple music video
11. Use and manage a variety of social music sharing tools

**Creative Applications of Music Technology for College Teachers  
(Pair with Table 1: Historical Categories/Instructional Context/Competencies,  
Webster & Williams, 2018)**

**A. Orchestration and Arranging**

**Music notation software used to teach proper scoring and to understand arranging techniques, which in turn, reinforces theory skills.** Students often have difficulty understanding the difference between slurs and ties and other subtle notation guidelines. Students are asked to arrange a more complicated composition with notation software and are required to be careful about notational conventions, rhythmic patterns, and harmonic and textural issues. These assignments also teach principles of arranging and orchestration which prepares them for a lifetime of practical experience for making music. Printed scores and parts can allow for music to be performed in theory, arranging and orchestration classes. Application of theoretical principles with live results in this context is key. (CMS Task Force Pillar: Creativity) Based on work by Jennifer Amays, California State Polytechnic University

**B. Music Theory/Composition Collaboration with Instrumental Music Methods**

**“Covering” leading to original composition.** Using informal practices of music making, an instrumental music education methods class or a theory class (or combination of both) will divide into small groups of instrumentals to “cover” a chosen piece. Groups will decide what music is to be played and how best to create the cover. No written music will be allowed. Music education and theory/composition faculty may serve as guides and for process. Time period would be two or three class sessions with some work outside of class by students without faculty present. Piece would be performed. This would be naturally followed by each group collaborating to compose and perform an original work that might be based on the musical properties of the cover. Discussion about how the task might be accomplished with students in K-12 environments and about copyright issues would be encouraged as follow up. Performances would be recorded digitally. Other software/hardware used in conjunction with acoustic instruments as needed. Cloud-based creativity software like SoundCloud, Noteflight, and SoundTrap with social networking tools might be a good fit for this activity. (CMS Task Force Pillars: Creativity, Integration)

**C. Piano Class, MIDI Performance Data; Copyright Discussion**

**Piano class or master class use of MIDI data and discussions of copyright.** In piano studio, use technology for reinforcing some aspect of instrumental pedagogy or even research. Establish a policy that students and teachers should no longer photocopy any scores for use, even single pages from an edition. Students need to either purchase printed editions of their music or look to the Internet for a legal digital version. This leads to some very interesting explorations of copyright, public domain, as well as comparisons of various editions found at the Petrucci Music Library (“Petrucci Music Library,” (n.d.)) Another experiment is to have students record passages from their repertoire in a MIDI application and examine MIDI performance data (duration, velocity contours, sustain pedal maps, etc.) to better understand musical elements such as rhythmic evenness, voicing and balance, legato, expression, and harmonic rhythm. It helps to have a first-rate 88-note MIDI performance keyboard with good sampled piano timbre which is the basis for explanations about sampling technology. (CMS Task Force Pillar: Creativity) Based on the work of Ray Riley, Alma College

**D. Improvisation and Live Performance**

**Improvisation in the studio.** Learning improvisation skills and their application in live performance is an important part of musicianship across all styles of music. In private lesson instruction for example, teachers could encourage students to “rewrite” an established piece of music in real time with simple extensions and alternations that are in the stylistic domain of the music. Such experiments might lead to the composition of small works that are in the style of a composer like Beethoven or Chopin. Performance of this music might be enhanced by music software that features “live” recording and playback of music in real time. Students working with a variety of styles can create duets with their own playing together with computer-controlled blocks of sound triggered by the technology. One point of this project is to augment the largely Western view of music performance always needing to be based on a perfect performance and to open up the performance to other ways of music creation to include online social collaboration through web-based tools. Such experiences might lead to more work with free improvisation with other players. (CMS Task Force Pillar: Creativity)

**E. World Music Instrument and Internet-Based Instruction**

**Teaching world music on the web.** Undergraduate music students learning about world music might use technology skills to develop a website that is interactive and teaches others about the music of non-Western cultures. Following a period where world music is studied by making acoustic or virtual instruments of other cultures, participating in performances lead by visiting artists from other lands, and by listening and reading about such music, students will take the knowledge, techniques, and sounds of a world music culture and create an interactive experience delivered by way of the Internet. Images, sound files, and videos could be the basis of an exploratory multi-media site using inexpensive authoring software and public domain materials. Projects can be linked and made a continuing part of a world music course materials. More ambitious versions of this project might be considered as a final capstone project for teams of students. (CMS Task Force Pillar: Diversity)

**F. Music History Collaboration: Performance Faculty and Music Teaching and Learning Specialists**

**Lecture recitals for undergraduates.** This project for undergraduates is based on the often-encountered graduate model of lecture recital, but with coaches from multiple disciplines. A chamber work might be considered as a group lecture recital project. Students are tasked with the job of preparing a lecture recital for a work being studied in the studio. The lecture recital might be prepared not for a concert hall but for a local venue such as a K-12 setting or community population. Students must feature important aspects of the historical context of the music as well as an analysis of the music itself in the lecture demonstration. Using guidance from both music history and music teaching specialists, presentation software would be used to enhance the recital. Students might be responsible for assembling the audio and video hardware for the presentation. A video might be made of the recital and then be reviewed by both performance and music history faculty. (CMS Task Force Pillars: Diversity, Integration)

### **G. Audio Documentation**

**Audio broadcast of a music topic.** This idea has its roots in the many NPR-like produced radio shows or professional podcasts available on the Internet. For this scenario, a student-produced “radio show” serves as the main center of this teaching project. Students choose a musical topic that can easily accommodate the inclusion of several music examples. The idea is to create a radio documentary which weaves in and out of voice narration and music. The task is to use information learned about an important music topic and create an interesting audio file (“radio show”) that explains the topic in sounds and words. Various original material would need to be created and blended with other audio available in the public domain. Interviews with experts on campus might be used. The product, once vetted by music faculty, could be offered to the local campus radio or FM station in the community for broadcast or posted on the Internet as a podcast. If successful, audio shows could become a regular part of promotion of the music unit in the community. Audio software and principles of audio editing and recording would be a major part of this project. The work can be anchored in any music course in the curriculum. One variation of this project would be to model not a radio show but a video such as seen in the famous TED talks. (CMS Task Force Pillars: Creativity, Diversity) Based on the work of Ray Riley, Alma College

### **H. Service Learning Project**

**Extending music experiences into the community.** Students are encouraged to go out into the community to complete large group service projects. One example would be to work with elementary schools or after school programs to teach younger students about music. Technology is a natural part of this effort. College students could be given one session (about an hour) to spend with all of the 4th graders, to encourage them to join the orchestra in 5th grade or to explore music making with software. Four or five “stations” (using laptops, Chromebooks, or tablets) that offer a variety of musical lessons, from making craft instruments to recording themselves singing could be created and administered by the college students. Small digital audio workstations could be used with pre-created backing tracks that might allow young students to add their own music. Youngsters might get a glimpse into the recording and editing process and be able to experiment with microphones and headsets. Another station might be devoted to explaining how certain acoustic instruments work or how conductors control the music performance of a composition by sharing different ways that gestures affect performance. This might be paired with an in-school performance later in the day by college students. Variations of this can be imagined in other community settings such as activity days at community centers or retirement homes and hospitals. (CMS Task Force Pillar: Creativity, Diversity) Based on work by Jennifer Amays, California State Polytechnic University

### **I. “Audio Ethnography”**

**Story of one’s life in sound.** Autoethnography is a personal narrative that explores the writer's experience of life. This work often focuses on the writer's subjective experience, rather than the beliefs and practices of others. Instead of a written narrative, this project centers on an audio narrative of who the student is. The materials will be a collection of music that describes who the student is, reflecting on interests, and representing the type of music the student enjoys, or anything else that will give us an idea of who the student is and what makes the person “tick.” Students are encouraged to include other non-musical sound sources to enhance the presentation. Students are encouraged to work with at least a half dozen musical sources that must be edited and processed into a cohesive musical narrative of several minutes. The personally produced and recorded audio autoethnography can be shared with others. Such a project might center itself in an interdisciplinary class that focuses on the merger of culture and art. Audio files will need to be constructed digitally and use a number of software and hardware technologies. Again, an alternative to this project could use sound and video and include places and other people as sources of the narrative; this would move the project into using some further resources of multimedia. (CMS Task Force Pillars: Creativity, Diversity) Based on the work of Gena Greher, University of Massachusetts-Lowell

### **J. Hybrid Ensemble of Digital Instruments**

**Using mobile devices to create ensembles.** With the popularity of cell phones and tablets and the variety of free or inexpensive virtual instrumental and ensemble software apps, it has never been easier to explore music making and creating digital ensembles for both music majors and non-majors in general studies classes. The project might center around the creation of digital ensembles charged with the task of creating new performances of familiar folk tunes, popular music songs, or original music of all sorts. The project offers creative opportunities for students to plan and collaborate on music projects. In addition to the digital instrument performance, management of the audio through microphone placement, mixing, and recording so that all performers can hear their work in tandem with others is an important part of this project. Final performances can be recorded and enhanced with post-processing and post-production activities. Files can be uploaded to Internet-based accounts and serve as a basis for class discussion. (CMS Task Force Pillars: Creativity, Diversity) Based on the work of Sandra Stauffer, Arizona State University

### **K. Copyright**

**Technology class work with copyright law.** Using a link to a website that contains the full copyright law to include the Digital Millennium Copyright Act, students can choose a chapter and an appendix and post summaries of each for others to read. Students can respond to one other person's posts with questions about how practices in the past may have been in violation of copyright. Gray areas can be identified and projects to clarify the law imagined. This could be followed by the creation of a three-minute Public Service Announcement (PSA) targeted at educators who may or may not realize they are violating copyright law. Various aspects of "fair use" can be featured. Students might be encouraged to provide solutions for a difficult situation. If a campus has an attorney with some background in copyright (or a librarian versed in copyright law), this might be an opportunity to reach out for a guest appearance. This might be a featured project in a stand-alone technology class or part of a more global effort by a music unit for all to experience in some form. (CMS Task Force Pillar: Creativity) Based on the work of Jane Kuehne, Auburn University

#### L. Notation Under Pressure

**Notation work as a "performance."** One interesting approach to assessing competence in music notation skills using software is to include is a "timed" experience in which students must complete a task in a given time period. Students are given a selected piece of music and are asked to enter, proof, print, and then submit the file by the end of an examination period, say a two-hour block of time. Facility with the skill, in addition to familiarity/concepts, is key to accomplishing this task. The idea is to discover how well a student can handle a notation task with the pressure of a timeline—a real-world task that may well be encountered in the future. This notion of effectively using music technology in time-sensitive settings can be applied also to digital arranging tasks or creating audio tracks to movies and television shows where production timelines are critical. Advanced understanding of how the technology works and the ability to apply musicianship ideas in effective time frames is key concept celebrated here. It also can be one measure of personal creative facility. (CMS Task Force Pillar: Creativity) Based on work by Charles Menoche, Central Connecticut State University

#### M. Creating an Ensemble Warmup

**Messing around with apps.** The project can be accomplished as part of a music technology course or as part of any music education setting. The purpose is to familiarize students with digital technology tools available for use in most music classrooms. Students will be asked to arrange a "warmup" chorale for an instrumental or vocal ensemble. Part of this project is "messaging around" with the software applications to figure out how they work. Students are encouraged to try them out and ask others for help, if needed. Steps include selecting six to eight measures from a chorale by J. S. Bach. Using a readily available online notation program, arrange the chorale for an ensemble of your choice using four separate parts and appropriate staves. Students might choose to arrange the chorale for an instrumental or vocal ensemble that is well known to them. Students can print out a copy of the score or use the screen as sheet music. The music can then be recorded live in a recording application of choice and possibly the written scores and sound files can be shared with Internet resources. An extension might be to discuss how this project might be completed by middle or senior high school students or a group of amateur musicians as a community project. (CMS Task Force Pillar: Creativity) Based on the work of Rick Webb, State University of New York, Fredonia

#### N. Free Improvisation Capstone

**Large ensemble experience.** The final two scenarios might be envisioned as capstone projects. This exemplar might be organized by a student or a group of students and [?] centers on large ensemble work in free improvisation. Free improvisation is a special kind of improvisation that does not tie performers to any stylistic formulae, allowing performers to respond freely to each other in musical ways. A leader is sometimes used to establish parameters regarding length and beginning and perhaps ending points. Various kinds of ensembles can be used and/or an eclectic collection of analog and digital instruments are possible. Western and non-western instruments can be used as well as voice parts. Experiments with free improvisation can be done with experienced performers or less experienced ones. After the performance of a number of pieces, discussion can be imagined that integrates the music created and the process used. Music performances can be recorded and archives formed. A student or group of students can also extend the audio work into more formal analytical papers that reflect on the history and development of free improvisation as a musical experience. The total project would be documented in ways consistent with the music unit's requirements. (CMS Task Force Pillars: Creativity, Diversity, Integration)

#### O. Music Production with Dancers

**Interdisciplinary collaboration.** This capstone might be accomplished by a student conductor, composer or group of students interested in interdisciplinary production from many fields of study. The idea would be to create a concert featuring the influence of black music in American culture. The concert would be a combination of (1) live performance of selected works from Afro-Cuban, Afro-Columbian, Afro-Brazilian, Afro-Bolivian, or Afro-Mexican styles (use of contemporary hip hop and rap-type music as well as jazz influences might be employed) and (2) short student-constructed explanations of the music for the audiences. The concert would be supported by visuals and dance. The concert would be organized by the ensemble participants, with major input from as many students in the ensemble as possible. Dancers would be an important part of the experience and choreography would be seen as key. The capstone could well be a collaboration between students in music and dance and involve faculty in both music and dance departments or schools. The final performance might be recorded and software used to create a streamed video for sharing through social media tools. The final activity could be the production of a short documentary video that records the development of the project from inception to completion. (CMS Task Force Pillars: Creativity, Diversity, Integration)