



Journal of the  
Music & Entertainment Industry  
Educators Association

Volume 21, Number 1  
(2021)

Bruce Ronkin, Editor  
Northeastern University

Ben O'Hara, Associate Editor (Book Reviews)  
Australian College of the Arts

Published with Support  
from



# Linking Creative Practice with Audio Production Education in the Music Industry Classroom

Doug Bielmeier  
*Northeastern University*

<https://doi.org/10.25101/21.2>

## Abstract

Since the inception of audio production programs a schism has existed between creative practice (e.g., composers) and technical roles (e.g., audio engineering). However, as the democratization of technology has been integrated into modern audio production workflows, contemporary audio professionals and students are increasingly seeking ways to combine music creation and recording, editing, and mixing. As a result, there is a demand for audio production programs to develop curricula that links creative practice with commercial audio production education in the classroom. This paper a) identifies the ambiguity when defining contemporary audio production programs, b) describes the educational goals of current audio production students to prepare themselves for employment in the contemporary music industry, and c) details the five phases of creative practice for the development of critical thinking skills, troubleshooting, and the ability to work under the authority of a mentor. In addition, this paper describes a Basic Creative Recording Project (BCRP) which balances technical learning objectives while incorporating the acquisition of creative practice skills in the classroom. The BCRP project schedule is detailed with examples for meetings and assignments. A process-based assessment is described and includes detailed session documentation, recursive feedback loops, and verbal presentations. Infusing the creative process within an audio production project can help to engage students in the classroom who are already involved in the creative process.

Keywords: audio education, music industry, music industry education, experiential learning, assessment

## Introduction

A tonmeister is an audio recording professional who is trained in music, acoustics, physics, and mechanics, and has the ability to control and improve the sonority of recordings, radio broadcasts, and sound films as defined by Arnold Schoenberg in the 1940s (Borwick 1973a; Borwick 1973b; Bielmeier 2013b). Schoenberg, an influential composer of the twentieth century, identified this training as essential not only for recording, but for the creation and execution of future creative works. Unfortunately, many educational institutions did not embrace the tonmeister educational ideal. In fact, as music education progressed throughout the twentieth century, audio production programs separated recording from creative practice and specialized in technical, scientific, and competency based educational models (Gadhoke 1978; Lodge 1978; Stockham 1977; Gander 1978; Manquen 1978). Nevertheless, contemporary audio production professionals often find themselves in roles that require them to be both content creators and content editors (Lankford 2018). These modern audio workflows and work environments mirror the deep and cross-disciplinary training described by Schoenberg almost one hundred years ago.

Many contemporary educational institutions segregate learning of students wanting to train as content creators (e.g., composers) or as content editors (e.g., recording engineers) (Phillips 2013). This delineation of academic majors was effective for previous generations of students who entered technical programs to engage with, and have access to, expensive and sophisticated technology (Lightner 1993; Sanders 1994; Walsh 1996). However, the democratization of technology has enabled students to gain experience with software, recording, and music creation prior to enrollment in an audio educational institution (Tough 2009; Tough 2010). Moreover, most students matriculating in audio production programs already engage in creative practice (Bielmeier 2017; Merchant 2011). Specifically, students use laptops and simple production software to create musical works ranging from four-bar loops to sophisticated orchestrations.

This experience with home recording has influenced students' expectations of audio production education threefold. First, many students view their audio production education as a method to refine their existing creative practices (Bielmeier 2017). Traditional composition programs often require a high level of musical aptitude for performance and sight-reading, which may not be required for a student's personal creative pursuits (Phillips 2013). Second, many students are not interested in earning a degree

in solely traditional composition at a rigorous or conservatory level, but rather are combining audio production with other majors such as music industry or electrical engineering (Bielmeier 2017). Third, students are often not interested in learning skills not directly connected to a job in an audio production studio or the music industry (Tough 2010; Bielmeier 2017; Merchant 2011).

To reflect the modern student, some institutions have created Music Technology programs, which are a blending of traditional composition programs and audio production programs mediated through technology (Phillips 2013). However, little to no research exists on these relatively new programs, and thus their efficacy and ability to prepare students to work in the audio production and music industries is unknown. Furthermore, best practices for creating purposeful music technology classrooms are limited.

This paper provides best practices in linking creative practice within commercial audio production education at the classroom level. It a) identifies the ambiguity when defining contemporary audio production programs, b) describes the educational goals of current audio production students, and c) details the five phases of creative practice. In addition, this paper describes a Basic Creative Recording Project (BCRP) which balances technical learning objectives while incorporating the acquisition of creative practice skills. The BCRP project schedule is detailed with examples for meetings and assignments. A process-based assessment is described and includes detailed session documentation, recursive feedback loops, and verbal presentations.

## **Ambiguity in Contemporary Audio Production Education**

Future sound recording technicians (e.g., recording and mix engineers) who work in the audio production industry are commonly trained in formal audio production programs (Gadhoke 1978; Gander 1978; Lightner 1993; Lodge 1978; Maquen 1978; Merchant 2011; Sanders 1994; Stockham 1977; Tough 2010). Audio education students can select educational institutions ranging from short certification programs to four-year tonmeister programs. These audio educational programs vary in awarded degree, length of matriculation, area of focus, and educational setting (e.g., university department or within a business) (Phillips 2013). As a result, there is currently no one definition for formal audio production education, which causes confusion about what skills students have acquired based

on education type (Bielmeier 2013a; Bielmeier 2013b; Bielmeier 2016). When looking at just four-year bachelors-level degrees, the focus of rigor is commonly influenced by where the education is taking place (as shown in Table 1). More specifically, music and fine art degrees focus more on musical training while the bachelor of science programs focus more on computer programing, engineering, and acoustics. Surprisingly, however, this is not always the case. When reviewing course requirements and objectives of several major U.S. audio production programs, many include a large number of elective courses in both music and sciences and allow for minoring in related technical fields (Bielmeier 2018; Bielmeier 2019). In addition, there is a lack of consistency in program titles across all audio production programs in the United States (Phillips 2013). There are several program titles that are the same regardless of the college from which the degree is awarded, which is surprising because previous research suggests that these programs have different areas of rigor (Phillips 2013; Lightner 1993; Sanders 1994; Walsh 1996). It is unclear whether this ambiguity in focus of rigor hinders student as they seek employment after completing training.

<b>Audio Production Degree</b>	<b>Fields of Rigor</b>	<b>Program Titles</b>
Bachelor of Music (BM)	Music Theory, Ear Training, History, and Applied Instrument, Ensemble	<ul style="list-style-type: none"> <li>• Media <b>Music</b></li> <li>• <b>Sound Recording Technology</b></li> <li>• <b>Music Technology</b></li> <li>• <b>Recording Arts &amp; Sciences</b></li> </ul>
Bachelor of Fine Arts (BFA)	Music Theory, Ear Training, History, and Applied Instrument, Ensemble	<ul style="list-style-type: none"> <li>• <b>Audio Recording &amp; Sound Design</b></li> <li>• <b>Music &amp; Audio Technology</b></li> <li>• <b>Audio Engineering</b></li> </ul>
Bachelor of Arts (BA)	Breadth Across Disciplines (Liberal Arts Educational Philosophy)	<ul style="list-style-type: none"> <li>• <b>Audio Production</b></li> <li>• Computer <b>Music &amp; Multimedia</b></li> <li>• <b>Recording Industry</b></li> <li>• <b>Music Industry</b></li> <li>• <b>Commercial Music</b></li> <li>• <b>Music Technology</b></li> <li>• <b>Sound Recording Technology</b></li> </ul>
Bachelor of Science (BS)	Science, Computer Programing, Engineering, Electronics, Acoustics, Manufacturing	<ul style="list-style-type: none"> <li>• <b>Audio Technology</b></li> <li>• <b>Music Industry</b></li> <li>• <b>Music Media Production &amp; Industry</b></li> </ul>

Table 1. Types of audio production degrees with field of rigor and program titles for four-year bachelor's degrees (Phillips 2013).

Many graduates of formal audio production programs seek employment in the audio production industry (Bielmeier 2013a; Bielmeier 2016; Lankford 2018; Merchant 2011; Tough 2009). A common role is a sound recording technician as identified by the U.S. Bureau of Labor Statistics whose role includes a) operation and application of equipment to record, b) synchronization, mixing, or reproduction of music, voices, or sound effects in movie and video production, c) television production, and d) music production for major and independent labels (U.S. Bureau of Labor Statistics 2020). Unfortunately, there is little research on how each type of the aforementioned formal audio production training prepares students for careers in the audio production industry. Furthermore, the impact of constantly evolving technologies and workflows is not documented.

### Creative Practice in Audio Production Education

Creative practice refers to the intentional practice of creating by learning, mastering, and using the skills (i.e., craft, technical, artistic, intellectual, and creative) that are required for making creative work (Burton 2009). Creative practice encompasses the act of making art as well as incubation of thoughts and ideas. The creative process includes five major phases as shown in Figure 1. Each phase in creative practice has several substeps and is essential for the overall success of the creative process (Smith 2009).

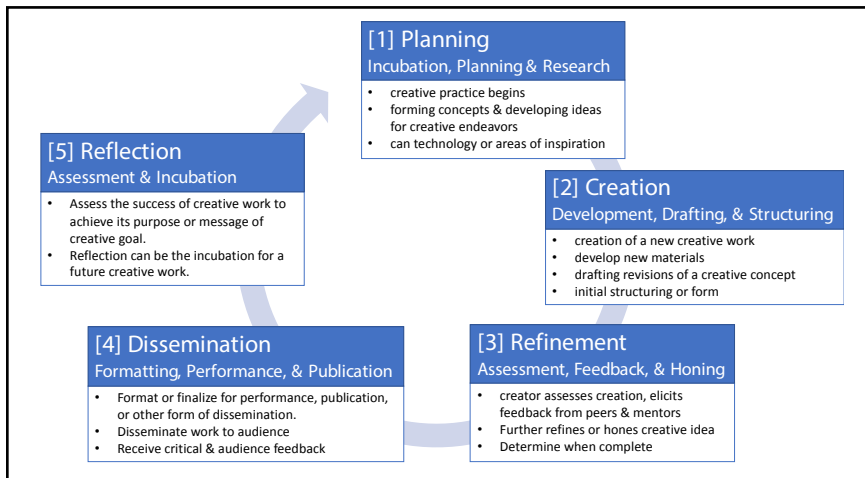


Figure 1. Five phases and sub-steps of the creative process (Smith 2009).

The creative process is commonly integrated into courses in the humanities and social sciences as compared to education and engineering. However, understanding and engaging with the creative process helps students as they undertake creative activities within a discipline (Comunian 2015). Students typically consider courses in the field of arts, humanities, and social science more impactful than courses in education and engineering and describe these courses as highly influential in the development of their own creative process (Daly 2016).

The development of an interdisciplinary application and formation of a repertoire of creative works, or portfolio, that benefits from refinement and revisions based on feedback from mentors and peers are the practical outcomes of engaging in creative practice (Kelly 2016). Open-ended projects, practice on exercises, and instructor feedback are common elements of creative practice and are closely related to the practices of self-directed and problem-based learning, experiential learning, and use of recursive feedback (Merchant 2011; Hiemstra 1994; Hmelo-Silver 2004; Kolb 2014). Therefore, the integration of the creative process within the education and engineering fields can assist in the development of creativity in students.

Infusing the creative process in the classroom via an audio production project can help to engage students already involved in the creative process (Merchant 2011). The creative process benefits students by developing skills such as critical thinking, troubleshooting, and working under the authority of a mentor. The development of these skills was indicated by employers, educators, and students, as highly desirable skills for sound recording technicians working in the audio production industry (Bielmeier 2013a; Bielmeier 2013b; Tough 2009). Infusing the creative process into a traditional recording project requires some restructuring of project learning objectives at the classroom level and requires a process-based assessment.

### **Basic Creative Recording Project**

To engage students of audio production programs, a basic creative recording project (BCRP) is proposed which requires students to work in small production teams to complete a final mix for a single song or composition. Tasks will include songwriting/composing, demo recording, full tracking session, additional orchestration and arrangement, and multiple mix revisions. Production teams will consist of composers, arrangers, pro-

ducers (i.e., advanced students), and tracking engineers. Production teams will need to identify an artist to record who can be a composer or artist from within the group. Production team members are required to conduct several recording sessions and should be available during project benchmark meetings. The BCRP will enable students to complete one cycle of the creative process with a creative outcome defined by the production team.

The BCRP’s learning objectives are:

- a. Complete an audio production and engineering project,
- b. Apply technical skills in project completion,
- c. Identify and meet important benchmarks and deadlines,
- d. Communicate effectively with artists, musicians, and team members,
- e. Address and interpret feedback,
- f. Publish the final production for dissemination and feedback, and
- g. Apply skills for creative practice.

These goals reflect the important aspects of a successful recording production and creative process. Students will be required to engage technically and creatively to complete the project.

In the BCRP, having specific project phases is important for the coordination and assessment of project progress. For each project phase, Table 2 shows the meetings, presentations, recording tasks, and creative practice phases.

<b>BCRP Phase</b>	<b>Presentation</b>	<b>Recording Task</b>	<b>Creative Practice Phase</b>
Preplanning	Artist Review	None	1
Preproduction	Demo Review	Demo Session	1 & 2
Recording	Tracking Review	Tracking Session	2
Postproduction	Mix Review	Initial and Revised Mixes	3
	None	Final Redbook Pre-Master	3
Distribution	None	File, Meta Data, Art Upload	4 & 5

Table 2. Course project summary, deliverables, recording tasks, and remote recording modalities.



During the Preplanning phase, production teams will conduct a group meeting and create a brief presentation of their proposed artist. This presentation, the Artist Review, will contain a) biographical and contact information of the artist, b) musical samples/examples of the artist from current or previous work, and c) an outline of goals for the rest of the project. This first phase requires students to use the first phase of creative practice by incubating an idea, planning, and research. Note, this creative phase may be completed prior to the course project by a group member who has already created an idea.

The Artist Review will be presented during a class meeting that will enable the coordination of all production teams, including producers and engineers, as well as artists, musicians, and additional stakeholders. Also, the production meeting requires production groups to confirm their artist and production approach and receive feedback from the professor and peers to further refine their approach and project goals. After the presentation, clarifying questions can be asked and answered to assist in further refining the project plan. Production teams will receive feedback from the professor and peers, and the feedback will be documented.

During the Preproduction phase, production teams will conduct a demo session and create a Demo Review presentation. The demo session will consist of vocals and at least one instrument, or at the bare minimum a recording that documents the form, lyrics, and foundational material of the proposed song or composition. This phase requires students to use Phase 1 and 2 of creative practice: the initial song or composition will be created by a group member.

The Demo Review Presentation will occur during a class meeting that allows students to present their demo session and receive feedback. The presentation will include a) all session documentation, b) the DAW session files, and c) goals for the tracking session including additional instruments and recording production. Production teams will receive feedback from the professor and peers, and will be documented. This feedback will focus less on the technical aspects of recording a demo and focus rather on the song and the creative process.

During the Recording phase, production teams will conduct several tracking sessions in which all musical elements of the project will be recorded: percussion, bass, harmony components, and lead and backup vocals. The Tracking Review will be presented during a class meeting that allows students to present a tracking session and receive feedback.

The presentation will include a) all session documentation, b) DAW session files, c) goals for additional tracking, and d) feedback from artist, classmates, and professor on additional tracking production needed before mixing can commence. Production teams will receive feedback from the professor and peers, and will be documented. This feedback will focus on the technical aspects of the recording process including mic choice and placement, evaluation of performance, consideration for additional instruments, and arrangement components.

During the Postproduction phase, production teams will create an initial mix of their project including several revisions based on feedback from the professor and peers. This phase will allow students to work in the fourth phase of creative practice as they may be required to create additional instrument parts or add to the musical arrangement. The Mix Review presentation will occur during a class meeting where production teams will present the initial mix of their artist. The presentation will include a) all session documentation, b) DAW session files, c) goals for additional mixing, and d) feedback from artist, classmates, and professor on changes to be made on the mix. Furthermore, conducting several of these mix review sessions during class meetings is highly suggested as often developing engineers will need several drafts and revisions to meet client and course goals. The Listening Party will occur during a class meeting where each production team's final Redbook pre-master will be played allowing artists, classmates, and professor to provide any final feedback or summative reflections. Also, an optional phase to the BCRP is to include basic finalizing or mastering benchmarks to prepare the mixes for digital release.

During the Distribution phase, production teams will digitally distribute the final production for dissemination and outside feedback. Figure 2 shows an example of a digital release of a similar project.

There are several music distribution services that will allow for the upload, metadata creation (including ISRC codes), and distribution of the final output of each production team. In fact, some music distribution services offer free licensing, royalty collection, and dissemination on the major music streaming applications and services. Often music distribution services allow for uploaders to create an institutional or "Label Account," which allows for the upload of multiple compilation albums. Depending on time and experience of students, the professor or facilitator may conduct uploading and formatting. This final distribution is important for

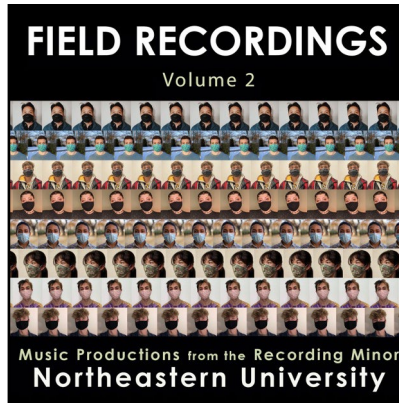


Figure 2. Northeastern University's Recording Minor release *Field Recordings Volume 2* (2020).

Phases 4 and 5 of the creative process which requires students to engage in dissemination and reflection.

### Process-Based Assessment

Process-based assessment borrows from the cognitive apprenticeship model, which suggests that future engineers need strong procedural knowledge of technology (Hiemstra 1994). This strong foundation in audio practice and production is especially needed in the audio for game industry because employees are typically from disparate audio backgrounds and specializations (Hmelo-Silver 2004; Sarisky 2011). Furthermore, research shows that some educators feel a multidisciplinary approach to audio education helps students obtain an understanding of their own workflow and how it applies to other roles in the creative fields of film and media (Lankford 2018). This process will assist in the development of each student's personal creative process (Kelly 2016, Kolb 2014). Traditional outcome-based projects should be graded via process-based assessment (Hmelo-Silver 2004; Rodgers 2014). For example, grading the output or artistic quality of a novice or basic-level project is not purposeful. Such a project may require students to hook up an audio interface and record via a microphone. Therefore, credit/points should focus on the process, both the technical, creative, and social skills pertinent to the assignment.

In the proposed BCRP, the process-based assessment will quantify the technical and musical outputs of the project and will focus on students' ability to manage, apply, and navigate the creative process. The

use of documentation, recursive feedback loops, and verbal presentation with critique will enable assessment at the completion of each phase. The requirement for session documentation at each phase of the BCRP allows the professor to evaluate the project progress and allows students to reflect on the pre-session planning, organization of musicians, and reservation of resources. Implementation of a recursive feedback loop fosters the ability of students to work under a mentor (Merchant 2011; Bielmeier 2014).

A recursive feedback loop requires students to submit projects and course work, receive feedback from instructors, and then make alterations in response. Potentially, students could rework a specific project several times until they have reconciled all feedback to the professor's satisfaction. This recursive feedback loop integrates one-on-one or mentor/mentee opportunities within the classroom and hones a student's ability to communicate with clients and coworkers and to respond to feedback (Merchant 2011; Bielmeier 2014). During this feedback process, it is important for the professor to determine both the number of iterations and appropriate grading scheme to create incentive and meaning for each feedback round.

Within the BCRP, each recording task requires a draft submission followed by a final submission. The rubrics for both the draft and final submission include categories for pre-planning, creative outcomes, and documentation. However, the draft rubric focuses on the collection of feedback, whereas the final rubric focuses on the application of the collected feedback. Table 3 shows the Tracking Draft Grading Rubric which details the actions that should be taken by each member of the production team. This is a group assignment and therefore students are not graded individually but rather receive a grade based on their team's ability to complete the required objectives outlined in the rubric. The team approach reflects the modern audio production workflow and allows students who have previous experience with a specific skill to mentor peers on that skill.

Teams of students are required to obtain feedback, suggestions, and client input via synchronous class events and asynchronous course discussion boards. The Tracking Final Grading Rubric is shown in Table 4 and requires students to make revisions based on feedback. Therefore, documenting feedback is important in project assessment as well as achieving musical outcomes.

Often in listening sessions or production meetings there is a focus on the outcome, or what the client, producer, or label is hearing. This requires an engineer to reflect on how the production techniques and processes

Grading Criteria	Ratings			Score
	Excel (5 points) Complete	Satisfactory (2.5 points) Missing Elements	Novice (0 points) Incomplete	
Pre-plan	Coordinates with musician and creates a pre-plan	Failure to either record musician or coordinate with musician and create a pre-plan	Fails to complete category	
Session	Recording of all instruments/components for final production	Struggles to perform recording of required instruments and components for final production	Fails to complete category	
Documentation/ Turn-ins	Includes all session doc on Canvas and uploads to folder in RCP cloud storage. Student uploads entire Pro Tools session and all session doc to cloud storage and shares link via Canvas	Fails to include all session doc on Canvas and uploads to folder in RCP cloud storage. Or fails to upload entire Pro Tools session and all session doc to cloud storage and shares link via Canvas	Fails to complete category	
Discussion	Shares link to Redbook bounce of demo and includes a) all session doc, b) Pro Tools session, c) goals for add tracking, d) elicits feedback from artist, classmates, and professor on add tracking	Missing components when sharing Redbook bounce of demo or a) all session doc, b) Pro Tools session, c) goals for add tracking, d) elicits feedback from artist, classmate, and professor on add tracking	Fails to complete category	
Total Score (20 Points)				

Table 3. Example of a Grading Rubric for Tracking Draft.

used are affecting these musical outcomes. In a process-based assessment, reflection on tools used to obtain a musical outcome is evaluated.

In the BCRP, verbal presentations allow students to review and reflect on each completed recording and creative task. When students are presenting a specific task, they are reflecting and summarizing not only the musical or artistic outcomes, but are also detailing their process. Refining this process, based on client (and in this case professor and peer) feedback is deemed essential by employers in the industry (Bielmeier 2013a; Bielmeier 2013b) and will enable students to refine their creative process.

Grading Criteria	Ratings			Score
	Excel (5 points) Complete	Satisfactory (2.5 points) Missing Elements	Novice (0 points) Incomplete	
Pre-plan	Coordinates with musician and creates a pre-plan	Fails to coordinate with musician and create pre-plan	Fails to complete category	
Session	Recording of all instruments/components for final production	Struggles to perform recording of required instruments and components for final production	Fails to complete category	
Documentation/ Turn-ins	Includes all <i>updated</i> session doc on Canvas and uploads to folder in RCP cloud storage. Student uploads entire Pro Tools session and all session doc to cloud storage and shares link via Canvas	Fails to include all <i>updated</i> session doc on Canvas and uploads to folder in RCP cloud storage. Or fails to upload entire Pro Tools session and all session doc to cloud storage and shares link via Canvas	Fails to complete category	
Feedback	Based on in-class feedback and feedback provided on Canvas Discussion Board, changes to original recording	Not applicable	Fails to complete category	
Total Score (20 Points)				

Table 4. Example of a Grading Rubric for Tracking Final.

## Conclusion

As stated earlier, a tonmeister is an audio recording professional who is trained in music, acoustics, physics, and mechanics, and can control and improve the sonority of recordings, radio broadcasts, and sound films. The original intent of this designation was to identify audio professionals trained to assist in audio recording. However, contemporary audio professionals and students could benefit by removing the schism between creative practice (e.g., composers) and technical roles (e.g., audio engineering). With the democratization of technology, contemporary audio professionals and students are increasingly seeking ways to combine music creation and editing to meet modern audio production workflows.

This paper provided a review of best practices for linking creative practice within a commercial audio production education classroom. The paper identified the ambiguity when defining contemporary audio produc-

tion programs and detailed students' desires to matriculate in formal audio production training to prepare themselves for a career and roles in the contemporary audio production industry. In addition, the paper described five phases of creative practice and its use and efficacy in higher education for the development of skills such as critical thinking, troubleshooting, and the ability to work under the authority of a mentor. The development of these skills was indicated by employers, educators, and students as highly desirable skills for sound recording technicians working in the audio production industry (Bielmeier 2013b; Bielmeier 2013a; Tough 2009).

A Basic Creative Recording Project (BCRP) was described that balances technical learning objectives while incorporating the acquisition of creative practice skills. The BCRP project schedule was detailed with examples for meetings and assignment turn-ins. A process-based assessment was described and included detailed session documentation, recursive feedback loops, and verbal presentations. Two grading rubrics were presented for execution of a process-based assessment of the BCRP in the classroom.

More research into creative practice and its infusion into audio production programs is needed. Infusing the creative process within an audio production project can help to engage students already involved in the creative process.

## References

---

- Bielmeier, Doug. 2013a. "What Skills New Recording Engineers Have and Where They Learn Them: A Survey of New Recording Engineers' Perceived Skill Sets and Those Observed By their Employers." Doctoral dissertation, Washington D.C. : Argosy University.
- Bielmeier, Doug. 2013b. "Why Didn't You Learn This at Recording School: Critical Comments by Employers." Paper presented at the AES 50th International Conference, Murfreesboro, Tennessee.
- Bielmeier, Doug. 2014. "Apprenticeship Skills in Audio Education: A Comparison of Classroom and Institutional Focus as Reported by Educators." Paper presented at the Audio Engineering Society Convention 137, Los Angeles.
- Bielmeier, Doug. 2016. "Audio Recording and Production Education: Skills New Hires Have and Where They Reported Learning Them." *Journal of the Audio Engineering Society* 64, no. 4: 218-228.
- Bielmeier, Doug. 2017. "Audio Recording Production Students Report Skills Learned or Focused on in Their Programs." Paper presented at the 143rd International Audio Engineer Society Convention, New York.
- Bielmeier, Doug. 2018. "High School Students: Considering Sound Engineering Technician Programs." Paper presented at the Boston AES High School Educators Conference, Boston.
- Bielmeier, Doug. 2019. "Disruptive Creativity: A Review of Disruptive Technologies Used by Independent Music Producers." Paper presented at the Art of Record Production Conference, Boston.
- Boehm, Carola. 2007. "The Discipline That Never Was: Current Developments in Music Technology in Higher Education in Britain." *Journal of Music, Technology and Education* 1, no. 1: 7-21.
- Borwick, John. 1973a. "The Tonmeister Concept." Paper presented at the Proceedings of the 46th Audio Engineering Society Convention, New York.
- Borwick, John. 1973b. "What is a Tonmeister?" *Studio Sound* 2, no. 2.
- Burton, Judith M. 2009. "Creative Intelligence, Creative Practice: Lowenfeld redux." *Studies in Art Education* 50, no. 4: 323-337. <https://doi.org/10.1080/00393541.2009.11518779>.



- Comunian, Roberta, and Abigail Gilmore. 2015. *Beyond the Creative Campus: Reflections on the Evolving Relationship Between Higher Education and the Creative Economy*. London: King's College London.
- Daly, Shanna R., Erika A. Mosyjowski, Stephanie L. Oprea, Aileen Huang-Saad, and Colleen M. Seifert. 2016. "College Students' Views of Creative Process Instruction Across Disciplines." *Thinking Skills and Creativity* 22: 1-13. <https://doi.org/10.1016/j.tsc.2016.07.002>.
- Gadhoke, Raghu. 1978. "Curriculum in Recording Engineering." Paper presented at the 60th AES Convention, Los Angeles.
- Gander, Mark R. 1978. "Balancing Theory and Practice in Audio Education: Experience of a Recent Graduate." *Lansing Sound, Inc*, 1 (January): 15.
- Hiemstra, Roger. 1994. "Self-Directed Learning." In *The International Encyclopedia of Education* 2nd ed., edited by Torsten Husen and T. Neville Postlethwaite. Oxford: Pergamon Press.
- Hmelo-Silver, Cindy E. 2004. "Problem-Based Learning: What and How Do Students Learn?" *Educational Psychology Review* 16, no. 3: 235-266. <https://doi.org/10.1023/B:EDPR.0000034022.16470.f3>.
- Ibisworld. 2019. "Audio Production Industry Reports." <https://www.ibisworld.com/>, <http://clients1.ibisworld.com.ezproxy.bu.edu/reports/us/industry/default.aspx?entid=1254>.
- Kelly, Robert. 2016. "Engaging in Creative Practice: From Design Thinking to Design Doing." In *Creative Development: Transforming Education Through Design Thinking, Innovation, and Invention*, edited by Robert Kelly, 57-68. Edmonton, Alberta: Brush Education, Inc.
- Kolb, David A. 2014. *Experiential Learning: Experience as the Source of Learning and Development*. Upper Saddle River, New Jersey: Pearson Education.
- Lankford, Elsa, and Adam Schwartz. 2018. "Case Study: An Interdisciplinary Audio Curriculum." Paper presented at the Audio Engineering Society Convention 145, New York.

- Lightner, John W. 1993. "A Survey of the Professional Audio Industry in an Eight-State Region to Assess Employers' Perceived Value of Formal Audio Education and Their Perceived Training Needs for Entry-Level Employees." Masters thesis, Big Rapids, Michigan: Ferris State University.
- Lodge, Tom. 1978. "A Curriculum in Music Industry Arts." *Journal of the Audio Engineering Society* 15: 7-9.
- Manquen, C. Dale. 1978. "An Audio Design Engineering Certificate Program for BS Students in Electrical Engineering." *Journal of the Audio Engineering Society* 15: 17-18.
- Merchant, John H. 2011. "A Revised Approach to Teaching Audio Mixing Techniques: Applying the Deliberate Practice Model." Paper presented at the Audio Engineering Society Convention 131, New York.
- Phillips, Scott L. 2013. *Beyond Sound: The College and Career Guide in Music Technology*. Oxford: Oxford University Press.
- Rodgers, Jeffrey. 2014. "Partnering Approaches for Teaching Music Technology." Paper presented at the Audio Engineering Society Convention 137, Los Angeles .
- Sanders, D. H. 1994. "The Professional Preparation of the Audio Engineers: A Survey of Studio Personnel and Recommendations for School Curricula Design." *Dissertation Abstracts International* (UMI No. 9423006) 55, no. 04: 797.
- Sarisky, Mark J. 2011. "Integrating "Audio For Games" Into the Modern Production Curriculum." Paper presented at the AES 41st International Conference: Audio for Games, London.
- Smith, Hazel, and Roger T. Dean, editors. 2009. *Practice-led Research, Research-led Practice in the Creative Arts*. Edinburgh: Edinburgh University Press.
- Stockham, Thomas G. 1977. "Records of the Future." *Journal of the Audio Engineering Society* 25, no. 10/11: 892-895.
- Tough, David. 2009. "Developing a Consensus-Driven, Core Competency Model to Shape Future Audio Engineering Technology Curriculum: A Web-Based Modified Delphi Study." Doctoral dissertation, Tennessee State University.
- Tough, David. 2010. "Shaping Audio Engineering Curriculum: An Expert Panel's View of the Future." 129th Audio Engineering Society Convention, San Francisco.

- U.S. Bureau of Labor Statistics. 2020. "Occupational Employment and Wage Statistics." Accessed May 2021. <https://www.bls.gov/oes/current/oes274014.htm#nat>
- Walsh, Eamonn Joseph. 1996. "Important Occupational Skills and Knowledge Needed in the Preparation of the Recording Engineer: A Survey of Faculty Perceptions." Doctoral dissertation, The University of Memphis.

**DOUG BIELMEIER** is an associate teaching professor in recording at Northeastern University with a doctorate in education and over fifteen years of experience teaching music, audio engineering, and music technology at the graduate and undergraduate levels. Dr. Bielmeier was formerly a freelance engineer in Nashville, Tennessee and has fifteen years proven success as a studio and live sound engineer. His live sound work has included working at the Kennedy Center, in Washington D.C., and sound for President Joe Biden. Bielmeier was the designer and studio manager of the C.L.E.A.R. Lab recording studio at the Purdue School of Engineering Technology. His papers on audio education, circular design, and music proficiency in media programs have been published internationally in the *Audio Engineering Society Journal*, *The Art of Record Production Journal*, and the *Journal for Media Education*. As a researcher, Dr. Bielmeier strives to understand what skills and competencies aspiring engineers need to develop to be successful in the audio industry.



The *Journal of the Music & Entertainment Industry Educators Association* (the *MEIEA Journal*) is published annually by MEIEA in order to increase public awareness of the music and entertainment industry and to foster music and entertainment business research and education.

The *MEIEA Journal* provides a scholarly analysis of technological, legal, historical, educational, and business trends within the music and entertainment industries and is designed as a resource for anyone currently involved or interested in these industries. Topics include issues that affect music and entertainment industry education and the music and entertainment industry such as curriculum design, pedagogy, technological innovation, intellectual property matters, industry-related legislation, arts administration, industry analysis, and historical perspectives.

Ideas and opinions expressed in the *Journal of the Music & Entertainment Industry Educators Association* do not necessarily reflect those of MEIEA. MEIEA disclaims responsibility for statements of fact or opinions expressed in individual contributions.

Permission for reprint or reproduction must be obtained in writing and the proper credit line given.

Music & Entertainment Industry Educators Association  
1900 Belmont Boulevard  
Nashville, TN 37212 U.S.A.  
[www.meiea.org](http://www.meiea.org)

The *MEIEA Journal* (ISSN: 1559-7334)  
© Copyright 2021 Music & Entertainment Industry Educators Association  
All rights reserved