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Audio+: A Research Forum to Transform our Traditions

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ABSTRACT

AUDIO+ engages students, researchers, and industry professionals in a critical dialogue on music production cultures, innovative technologies, and the pressing need for increased equity, diversity and inclusion in our field. Building upon a successful pilot workshop hosted online in November 2020, this paper highlights the integrated pedagogy of our research forum; the topics and presenters' demographics of the 2020 sessions; and our vision for the 2021 event. To show evidence of the teaching effectiveness of our audio education approach, we report on feedback from students about the 2020 edition. This work aims at providing a resource for educators and conference organizers who seek to design curriculums and events to transform audio traditions.

1 Introduction

1.1 A heteropatriarchal tradition

Historically, recordists learnt tacit knowledge on the job through an informal apprenticeship model [1]. This process of skill acquisition, with apprentice learning from master practitioners, has contributed to the establishment of a particular hierarchy of roles and conventions within the analog tradition of the commercial recording studio [2]. To this day, this learning process is still praised by the industry, and some educators strongly advocate for in-employment internship opportunities within formal programs to provide audio students with “real world” experiences [3][4]. While there is no doubt that this tradition has generated world-class recordists, in this paper we explain why its effectiveness and scope have reached a limit in the post-digital era, and we de-

fine the pedagogy of AUDIO+, a more contemporary way to think about audio education.

Recent Billboard chart demographics [5] and ethnographic studies [6][7] denounce the systemic gendering and heteropatriarchal culture of the commercial recording studio that keeps excluding women and gender-nonconforming people (WGNCP) and other representatives of minority social groups from the mainstream. For instance, a comparison with a study about women's experiences of microaggressions within STEM academia [8] indicates that “the recording studio workplace scores 33% worse on the silencing and marginalization of women, 33% worse on gender-related workplace microaggressions, and 24% worse on sexual objectification” [9]. Also, an analysis of “sound minds” [10] highlights how recordists “may be reluctant to change technologies and, by default, change methodology” once they have achieved commercial success and enjoy a

prolific network in the music industry. Therefore, the recordists who are referred to as *masters* of the tradition may not be the best ambassadors to inspire experimentation and cultural changes. As an alternative to continuing to apprentice in a traditional way, our research forum aims to engage the next generation of recordists in a critical dialogue on global music production and innovative technologies with industry professionals and researchers who represent diverse social groups and education backgrounds.

1.2 A privileged lineage

From the mid-20th century, a different tradition of audio education emerged in Germany and spread in Europe with the design of Tönmeister degrees that train recordists “to be both musically and technically proficient” [1]. Inspired by Austrian composer Arnold Schoenberg, the Tönmeister concept [11] consists of “training [your] ears as a musical instrument” [12] while acquiring a multidisciplinary set of skills through formal courses in Western art musicology (WAM) and fundamental knowledge in science, combined with experiential learning assignments in studio and in live concert settings. The technical freedom gained through this integrated pedagogy enables recordists to contribute to a range of projects and to create auditory illusions and virtual worlds, e.g. John Culshaw’s approach to produce recordings of Wagner operas from 1957-1967 [13]. While we both benefited from Tönmeister training at McGill and at the Paris Conservatoire, and we apply this integrated pedagogy to develop our teaching strategies, we stand against the elitism and the composer-centric foundation of the tradition. Although contemporary Tönmeister programs feature courses in popular music production, they still require a high level of scientific fluency and conservatory training for applicants to succeed through the admission process. These pre-requisites privilege white middle-class students with high ability levels who have been exposed to WAM since their childhood. Therefore, there is a need to “decolonize” the Tönmeister concept from its cultural hegemonies, first by democratizing its scientific principles while building upon best practices with regards to equity, diversity and inclusion (EDI), and second by redefining its artistic lineage to include a broad range of music performance and production cultures.

The German “post-war notion of technical intelligence” [14], which involves the teaching of philosophy to engi-

neers and technicians, has played an instrumental role within the Tönmeister lineage as most contemporary programs have implemented the completion of research projects in their curriculum for students to contribute to innovation in our field, e.g. the development of an eyes-free audio equalizer application [15]. In this view, Nyssim Lefford and Jan Berg prescribe a constructivist approach to teaching research with pedagogical and andragogical elements that is rooted in audio engineers’ “proficiencies for reliably predicting what something will sound like” [16]. This “from practice to research” approach in project-based environments guides students toward theory and inquiry. Moreover, it brings them to draw upon their ability to “listen not only to the sound, but also, to colleagues and clients working on the environment and on the same project” to develop their “social intelligence”. Therefore, this approach prepares the next generation of audio engineers to work together with researchers from diverse disciplines and equipment developers on the one hand, and with artists and music industry staff on the other. AUDIO+ extends the scientific focus of this approach by adding EDI considerations in its foundation, and by involving musicians, industry staff, anthropologists, and sociologists in its research forum.

1.3 Pre-echo in post-digital audio education

With the democratization of digital audio workstations (DAW) since the 2000s, for-profit audio programs have proliferated globally in postsecondary and private institutions. These programs monetize the apprenticeship model by hiring successful industry professionals to teach a set of courses that more or less mirror Tönmeister-based integrated curriculums. While “audio *informs* their pedagogy, *inspires* their practice, and *promotes* new and applied forms of knowledge exchange” [17], we argue that industry-educators would benefit from being more equipped in terms of teaching training and EDI expertise to meet the education challenges of our field, including the pressing need for a cultural change. Because *audio* at large is extremely gendered, with WGNCP comprising about 7% of AES members in 2016 [18] and less than 2% of authors of Invited Papers at AES Conventions from 2012-2019 [19], audio programs also remain gendered (e.g. the demographics of music technology degrees in the UK [20]). This persists despite the fact that many WGNCP have contributed to important innovations in our field since the 1830s [21]. Consequently, Paula

Wolfe advises aspiring female artists-producers against attending audio programs and studio internships to protect their self-confidence and inner artistic voice [6] [22]. Wolfe's recommendation and AES demographics call for the audio community to seek guidance from feminist music and engineering pedagogies to design and curate more inclusive audio program curriculums and research events.

Wolfe's study and a survey of Indigenous Australian Women producers' practices [23] hint that in the post-digital era, it is possible to develop production skills from home through online resources. These findings offer an optimistic perspective to WGNCP and people coming from low-income backgrounds whereas in the past, women audio engineers had to rely on books, which limited their acquiring practical knowledge [24]. Nevertheless, an ethnography of DAW-based studios in Bamako, Mali, relativizes this perspective as it reveals that although arrangers/engineers can learn how to successfully communicate with artists and manage their commercial studio on their own, they would need access to audio education to acquire more in-depth signal processing and acoustic knowledge in order to access the international market [25]. This ethnography outcome brings value to contemporary programs, especially when their pedagogy succeeds at teaching technical, teamwork, and critical thinking skills toward the uses of audio technologies [3]. With AUDIO+, whose attendance is free of charge, we incorporate empowerment principles and state-of-the-art research approaches to guide the next generation of recordists in finding their own way to integrate school-taught with self-taught knowledge in order to meet the aesthetics expectations and socioeconomic realms of a range of music industries.

1.4 Challenging audio meritocracy

Making a living in the commercial recording studio is more competitive now than ever, since recording budgets have kept decreasing due to mass Internet piracy in the 2000s and low revenues from streaming platforms in the 2010s. For instance, an international survey underlined that in 2019, cis-gender men studio professionals made an average of \$74/day, and only a third of them reported being always properly credited for their work [9]. This result questions the sustainability of the commercial recording studio model, especially for WGNCP, who are less remunerated and less properly

credited for their work than cis-gender men, and who experience a much higher level of microaggressions in the workplace. This result also suggests that the contribution of studio professionals to musical recordings have once again become invisible with the decline of the "analog business model" of the record industry towards independent business models [26]. The first AES meeting was held at RCA Victor Studios in 1948 for the corporation of sound mixers "to negotiate better wages" and to control "access to the skills of mixing by establishing union apprenticeship and seniority systems" [27]. More than 70 years later, to bring back value to our skills in the post-digital era, it is time for our community to redefine our profession by articulating how our artistic and technical knowledge can enhance music production and diffusion.

Outcomes from a 2008 survey indicate that the establishment of a client relationship between artists and recordists without the staff of labels as intermediaries encourages young musicians to praise engineers and producers' communication and interpersonal skills more than their technical, listening, and musical skills [12]. Also, while young musicians idealized transparent and fast engineers in their general descriptions of the profession, they reported on positive recording experiences during which they appreciated when engineers explained their sound choices to them. We draw a parallel between this discrepancy in the perception of the profession with recent studies whose authors, who are not audio engineers, pictured token engineers as being genius exceptions because they were able to contribute compositional ideas [14] or to propose a new recording approach [28]. Moreover, we can read in a prestigious academic journal that 'real' engineers can be distinguished from amateurs through their cable wrapping performances and their ability to hear artifacts of vocal autotuning [29]. These observations highlight the fantasy that real - versus genius and amateur - audio engineers are transparent, unable to innovate and to understand music cultures, with limited technical and critical thinking abilities. In this view, reputed musician-scholar Michael Veal stated in a discussion with audio engineer-scholar Whitney Slaten, "sometimes I think live sound engineers need to hide themselves because 80% of them are terrible at what they do", for example because they "transpose a rock mode of mixing to totally inappropriate genres" [30]. We want our forum to challenge the "analog audio meritocracy" and the recording studio myths [31] to provide

studio professionals and live engineers with a space to further develop their self-awareness and social intelligence, to thus be able to work successfully with artists in a respectful environment for all parties involved.

2 The AUDIO+ concept

2.1 Main objectives

- To build a community with a broad cross-section of member groups working in the field of audio;
- To strengthen collaboration and connections between audio students in Western Canada in the first instance, and globally in the future;
- To deliver high quality mentorship and training in research for undergraduate and graduate students, and early-career academics;
- To promote research-enriched teaching that connects theory and practice and that fosters innovation;
- To deconstruct the gender narrative that persists within the field of audio;
- To promote research in audio and music production beyond Western Europe and North America;
- To give more visibility to WGNC and BIPOC audio engineers and music producers.

2.2 Research forum EDI considerations

The objectives listed above are reflected in the main incentive for organizing this forum, i.e. gathering students of all levels, researchers, and industry professionals in the same physical or virtual space to work together at seeking solutions to contemporary audio problems, both technical and sociocultural. This event extends the format of research talks and audio tutorials because presenters go beyond sharing their project outcomes, expertise, and experience with an audience. Modelling our forum ethos, we attempt to blur the hierarchical structures between novice and accomplished professionals by recruiting undergraduate and graduate students to moderate round-table discussions, and PhD candidates to host panels. We are also pro-active in our invitation of presenters, aiming to achieve gender parity, and racial and cultural diversity. Forum participation is voluntary and free of charge, and student organizations are encouraged to advertise the events within their own

networks to ensure a broad spectrum of students are reached.

The design of workshop sessions promotes teamwork across institutions to consolidate different schools of thoughts and practices. In this view, research-enriched and integrated learning opportunities are offered through sessions that combine tutorial(s) by industry professional(s), research talk(s) by scholar(s), followed by a round table with presenters moderated by a student-research assistant who must prepare questions in advance. This session format draws upon the success of a cross-school recording contest and research symposium *Social distinction in the 21st recording studio*¹ at the University of Lethbridge on Feb 13-14, 2020. It illustrates how AUDIO+ activities directly support student learning, disseminate research, and also generate new findings and co-creation of knowledge. This aligns with Elizabeth Gould's feminist theory of music education that promotes "thinking beyond representations" while "always moving, never remaining" "to create [...] as a productive means of proliferate concepts occasioned by lived experience in order to create still more concepts" [32].

2.3 A cognitive apprenticeship approach

AUDIO+ applies a cognitive apprenticeship pedagogy that was first used in audio by Daniel Walzer [33], based on a theory developed to teach reading, writing and mathematics [34]. This pedagogy shares many features of the traditional apprenticeship model, including its informal and practical learning methods, with the addition of guided learning opportunities that emphasize intellectual and cognitive tasks that can be difficult to observe [35]. McNally and Toby Seay drew upon this theory to discuss how training approaches in the field are represented and therefore perpetuated by textbooks that we use in our classrooms [36]. In situated learning environments, this pedagogy requires both the mentor and apprentice to articulate their thought process throughout the completion of assigned tasks. On the one hand, it encourages the apprentice to reflect upon the differences between novice and accomplished professionals' performance, problem-solving and critical thinking capabilities, and thus to learn how to apply knowledge and skills in a variety of contexts with intrinsic motivation [37]. On the other hand, it offers the mentor a chance to question the relevance of their

¹<https://www.canal-u.tv/producteurs/afrinum/colloque>

practices and teaching in the post-digital era. This cognitive approach therefore associates “from practice to research” concepts in project-based environments [16] with a “pedagogy of sound” that brings learners to reflect upon creative processes rather than products to understand how “music meanings defer and unfold” [38].

2.4 Decolonizing the Tönmeister concept

To democratize the scientific principles of the Tönmeister concept, we engage learners in project-based environments with explicit goals while providing technical information directly applicable to these goals. This teaching strategy is in keeping with findings from an EDI study carried out at Carnegie Mellon that underlined how giving a purpose to technical exercises has helped retain more female students in their highly selective computer sciences program [39]. Adapting this approach to music production could be as simple as explaining to students how to read the frequency response of the microphones used during a recording session. Based on her experience and participants’ feedback from her recording workshop at the Conservatory of Arts and Multimedia Crafts Balla Fasseké Kouyaté in Bamako, Mali in July 2019, Pras believes this teaching strategy is effective with learners who have a limited education in mathematics and physics. This strategy can also be illustrated by the “Standard 3-point Micing Technique” that applies knowledge in room acoustics, microphone systems, and time-alignment mixing techniques in all sorts of recording contexts, e.g. a guitar amplifier recording recipe in *The Music Technology Cookbook* with two levels of difficulty [22].

To decolonize the Tönmeister concept from its WAM hegemony, we act on three recommendations from the music education literature [40], namely connect with the local; take the time to discover the origins of what and how you teach; and listen both closely and broadly. The first recommendation resonates with our attempt to empower our Canada-based students through meetings with Canada-based artists and engineers to better appreciate Canadian popular musics [41] and innovative technologies, and thus to stop assuming they have to move to the USA or to the UK to have an interesting career in audio. The second recommendation gives us the courage to acknowledge that the pioneer Tönmeister program of Düsselrdolf was founded by Friedrich Trautwein (1888-1956) who had committed to Nazi ideology and who first opened private classes in a bunker

[14]. We therefore call into question our motivations for controlling sound, and we reject the notion of sound purism that has been carried by the Tönmeister lineage. The third recommendation both echoes and challenges the implicit knowledge and social norms of emotional labor required from studio and live engineers to “create the right vibe” [42], through the ability to perform “a wide range of careful listening of other people and alternate voices” [40]. We aim to facilitate this learning of holistic listening skills by exposing the forum participants and ourselves to the “cultural dynamics of diverse musical forms” [43].

3 The 2020 pilot workshop

3.1 Demographics of 2020 presenters

We invited 14 audio people to present at the 2020 workshop on Nov 9-11, including five industry professionals, four scholars, and five students who we had hired as research assistants for several months on SSHRC-funded partnerships (i.e. one McGill PhD candidate, one UVic graduate student, one ULeth alumnus, and two ULeth undergraduate students). With the two authors, the workshop presenters counted four women, one GNCP and 11 men; of which three were BIPOC and 13 were white. Three presenters lived outside of Canada (Burkina Faso, UK, and USA). Of the 13 Canada-based presenters, six lived in Alberta, five in British Columbia, one in Ontario, and one in Quebec. Although the genders, racial and cultural backgrounds of the presenters were not as diverse as we expected, we signalled our commitment to give more visibility to WGNC recordists by inviting Amy King from Grant Avenue Studios (Hamilton, ON) as the keynote speaker.

3.2 2020 pilot workshop program

The program of the 2020 pilot workshop was designed in collaboration with the invited presenters and consisted of five sessions, a student meet-up, and a keynote talk². The complete event schedule is shown in Figure 1. The five sessions are detailed below, and together illustrate the AUDIO+ pedagogy.

A research presentation by UVic graduate student Jordie Shier, McGill PhD candidate Grace Brooks, and ULeth alumnus Ryland Chambers-Moranz introduced the workshop with preliminary outcomes that extend

²<https://www.youtube.com/watch?v=zaqHo2DUeJU>

a comparative study on analog versus digital mixing practices [44]. They explained how their multidisciplinary approach contributes to the development of a methodology that statistically correlates findings from a perceptual experiment to low-level audio features analysis. McNally then presented his collaborative research on studying record production through Music Information Retrieval (MIR) approaches, which attempts to use low-level audio features analysis to better understand decisions made by renown recordists in the studio [45][46][47][48]. Finally, Shier moderated a question-and-answer session between McNally and Georg Boenn, who teaches Digital Audio Arts at ULeth, on the future of MIR applications for audio and music industries.

The second day started with a student mixing and re-mixing competition. The judges included Jocelyn Greenwood, president of the independent record label Cordova Bay Records (Victoria, BC), Amy King, and the composer who contributed the music to be mixed or re-mixed, Anthony Tan, who teaches composition at UVic. A shortlist of five student mixes were auditioned by the judges, who provided valuable feedback to the students, based on musical, technical and commercial considerations. Sean Costello (Valhalla DSP) kindly contributed plugins for the competition winners. In the afternoon, Graemme Brown who owns Zen Mastering (Gabriola Island, BC) shared business aspects of the practice with forum participants, followed by a lecture on technical and artistic aspects that emphasized communication skills and best practices for health and safety.

On the third day, a Global Music Production session was organized to expose our students to DAW-based engineering practices in less economically privileged areas than Western Canada. Eliezer Oudba opened the session with an overview of his production of *One Love Africa*³, a cover based on the Bob Marley original, which he engineered at his Hope Muziks Studio (Ouadagoudou, Burkina Faso). Then, Eliot Bates who teaches at The Graduate Center, City University of New York, highlighted the main outcomes of his 13-year ethnography of DAW productions in Istanbul, Turkey [49]. During the roundtable *De-colonizing the DAW*⁴, ULeth student Leonard Menon led Oudba and Bates in a further discussion of the design and marketing of a

range of DAWs, whose WAM biases constrain producers from diverse music cultures in adapting their studio practices to globalized norms. For instance, Oudba referred to Bates' presentation⁵ of Turkish *aksak* (limping) [50] rhythms that do not fit in DAW time signature options to explain that some Western African musicians need to be trained by his assistants to perceive the downbeat of the click track in the same way Europeans and North Americans might. The conversation also underlined North/South inequalities in terms of access to digital technology and audio knowledge, a topic at the center of the research partnership coordinated by Pras and ethnomusicologist Emmanuelle Olivier that aims at renewing the discourse about innovation in Western African societies through the lens of popular music industries.

A final session before the keynote aimed to reflect upon audio educators' contrasting opinions about the benefits of teaching Critical Listening (CL) [51] versus Technical Ear Training (TET) [52] in audio curricula. James Clemens-Seely, head engineer of the Banff Centre for Arts and Creativity lectured on his approach⁶ to teaching both CL and TET, based on his student and instructor experience in the Sound Recording (Tönmeister) program of McGill. Then, ULeth student Kelsey Taylor facilitated the debate⁷ between Clemens-Seely and Paul Thompson who teaches music production at Leeds-Beckett University in England.

3.3 Feedback questionnaires

To provide us with attendee demographics in terms of institution affiliation, program and level of study, gender and race/ethnicity, we recorded registration and attendance for all five sessions of the 2020 pilot workshop (not for the student meetup and the keynote talk). Also, to show evidence of the teaching effectiveness of our pedagogy and to guide the design of the 2021 edition, we developed a series of questionnaires that we administered to the attendees by email at the end of each session. Eventually, a final questionnaire to prompt attendees' preferences in terms of the 2021 edition's period and location was distributed to all workshop participants at the conclusion of the event. All questionnaires were filled out on a voluntary basis and took only a few minutes of the respondents' time. For

³<https://youtu.be/NDltsj7fPCQ>

⁴<https://www.canal-u.tv/video/afrinum/roundtable>

⁵https://www.canal-u.tv/video/afrinum/timing_tuning

⁶https://www.canal-u.tv/video/afrinum/critical_listening

⁷https://www.canal-u.tv/video/afrinum/roundtable_discussion

Monday, November 9 th	Tuesday, November 10 th	Wednesday, November 11 th
	Student Mixing/Re-mixing competition 9:00 – 12:00 With Jocelyn Greenwood (Cordova Bay Records), Amy King (Grant Avenue Studio) and Anthony Tan (UVic)	Global Music Production 9:00-10:20 Eliezer Oubda (Hope Musiks), Burkina Faso 10:30-11:00 Timing, tuning and translating the DAW in Turkey, with Eliot Bates (CUNY) 11:10 - 12:00 De-colonizing the DAW, with Eliot Bates (CUNY), Amandine Pras (Uleth), and Eliezer Oubda, moderated by Leonard Menon (Uleth)
LUNCH		
Studying Record Production: MIR approaches 1:00-1:50 Analog vs. Digital, with Ryland Chambers-Moranz (Uleth), Ky Grace Brooks (McGill), Jordie Shier (UVic) 2:00-2:50 Sonic Visualizer workshop, with Kirk McNally (UVic) 3:00-4:00 Roundtable on MIR, with Georg Boenn (Uleth), Kirk McNally (UVic), moderated by Jordie Shier (UVic)	Audio Mastering with Graemme Brown (Zen Mastering) 1:00-2:20 The business of mastering 2:30-4:00 Mastering workshop	Critical Listening and Technical Ear Training 1:00-2:30 with James Clemens-Seely (Banff Centre), Paul Thompson (Leeds Beckett University), and Kelsey Taylor (Uleth)
DINNER		
6:30-8PM ULeth AES Student Chapter and UVic CMCU meet-up		6:30-8PM Amy King (Grant Avenue Studios)

Fig. 1: 2020 AUDIO+ schedule, all times in PST

each of the five sessions, we designed learning outcomes specific to the content of the presentations that respondents were asked to rate on a five-point Likert scale from ‘strongly agree’ to ‘strongly disagree’.

Table 1 presents attendees’ ratings of the learning outcomes for the MIR, Global Music Production, and CL & TET sessions. Also, all five session questionnaires included the following questions:

1. What is your institution?
2. In which year and degree are you?
3. How familiar was the topic of [session title] for you before you attended this session?
4. Would you recommend this session to your peers in the future?
5. Please let us know all the comments you may have about this [session title] session.

Furthermore, we welcomed spontaneous feedback by email, and requested senders’ authorization to use their

commentaries in event reports and funding applications.

4 The 2020 pilot workshop report

4.1 2020 pilot workshop attendance

In total, 38 people attended at least one the workshop sessions (excluding the authors). The MIR session attracted 23 attendees, the competition 8, the mastering session 23, the Global Music Production session 20, and the CL & TET session 15. The 38 attendees included nine women, four GNC, and 25 men; seven BIPOC and 31 white people. Fifteen of 38 attendees were studying at UVic, 14 at ULeth, three were UVic alumni, two were teaching at ULeth, one was a senior research fellow from CNRS (France), one was a McGill PhD candidate, one was a Banff Centre alumnus, and one was a Banff Centre educator. Of the 30 students who attended at least one workshop session, 21 were attending a Bachelor program, six a Master program, and three a PhD program.

4.2 Attendees' main feedback

Table 1 displays questionnaire respondents' ratings of their learning outcomes from attending the MIR, Global Music Production, and CL & TET sessions. Sixteen out of 23 attendees filled out the questionnaire about the MIR session, including eight affiliated to ULeth and eight affiliated to UVic, with a minimum of 3rd-year Bachelor for their level of study. Five reported being very familiar to the topic, eight somewhat familiar, and three not familiar. Whereas mathematics, statistics, and the science of audio placed some attendees out of their comfort zone with a lot to digest, they appreciated being able to experience knowledge in the field, and to understand how MIR relates to auditory perception and creation. There was a suggestion that we provide registered attendees with notes to review before and after attending such technical session in the future.

Seventeen out of 20 attendees filled out the questionnaire about the Global Music Production session, including ten affiliated to Uleth, six affiliated to UVic, and one to McGill, from the first-year Bachelor level to PhD. Only two reported being very familiar to the topic, seven somewhat familiar, and eight not familiar. Twelve out of 15 attendees filled out the questionnaire about the CL & TET session, including seven affiliated to ULeth and five affiliated to UVic, with a minimum of 3rd-year Bachelor for their level of study. Six reported being very familiar to the topic, five somewhat familiar, and one not familiar.

Twenty-six out of 38 workshop attendees filled out the end questionnaire, including 13 affiliated to ULeth, 12 to UVic, and one to McGill, from the first-year Bachelor level to PhD. Responses show that Fall Reading week in Western Canada is a good time to conduct this research forum. While 14 attendees would prefer the forum to be virtual, 28 would rather attend it in person, 18 at their own institution and ten at another institution. In the future, respondents would like to see the following technical topics to be included in the forum: synthesis techniques, Foley sound design and recording, signal processing, audio programming, and streaming. They also wish to attend more sessions about MIR, such as links between extracting MIR features and audio archiving applications. Finally, they elaborated on the delivery of music production sessions they would like to see, such as discussions about the pros and cons of home studios and evolution of recordists' profiles in the

21st century music industries, or witnessing complete music production processes, in particular for mastering.

Three attendees, i.e. a ULeth undergraduate student, a UVic graduate student, and a UVic PhD student sent us spontaneous feedback by emails and gave us the authorization to use the content in event reports and funding applications. They valued the workshop format and the opportunity to connect with industry professionals, researchers, and engaged students from other institutions. They appreciated that the event was free and that we had invited students to present their research. Finally, they offered to be more involved in the future than just attending sessions, for example by helping us to strengthen a Western Canadian network of audio engineers.

5 Towards the 2021 forum

A successful Social Sciences and Humanities Research Council of Canada (SSHRC) *Connection Grant*, awarded in May 2021 has provided us with funding to organize a more ambitious edition of the AUDIO+ forum in 2021. The hybrid 2021 edition will combine in-person and online sessions. It will continue our work to overcome practices and pedagogies in the field that are historically gendered, and to further illustrate and communicate the importance of connecting theory and practice.

We are organizing two sessions that integrate research as a structural element of the proposed activities. An in-person session will feature a partner ensemble, using immersive audio recording techniques and active binaural headphone monitoring for the conductor [53], a technology designed by Menon who will then be a M.Mus McGill Sound Recording candidate. A pre-event interview of the conductor's experience with wearing headphones during recording sessions, and technical experiments with KLANG binauralizer will inform this session that will be displayed as an open rehearsal with explanations from us and from the conductor. Also, Allison Sokil, a PhD candidate in Ethnomusicology at the University of Toronto (ON), will host an online panel with six to eight Canada-based WGNC active professionals who have directed and/or mentored in Canada-based music production programs that aim to enhance EDI in the field. These panelists will be interviewed prior the panel presentation, following rigorous data collection and analysis protocols to facilitate the co-creation of knowledge during panel discussions and

Table 1: Attendees' ratings of their learning outcomes from three sessions of the 2020 pilot workshop

During this session, I learned about...	Strongly agree	Somewhat agree	Neither agree or disagree	Somewhat disagree	Strongly disagree
Studying Recording Production through Music Information Retrieval approaches (n=16)					
audio feature terminology	7 (74%)	7 (74%)	2 (12%)	0	0
how audio features are being used in contemporary research	11 (69%)	4 (25%)	1 (6%)	0	0
how audio features are being used in contemporary creation	7 (44%)	9 (56%)	0	0	0
how audio features are being used in contemporary creation	4 (25%)	8 (50%)	3 (19%)	1 (6%)	0
Global Music Production (n=17)					
new collaboration approaches in music production	6 (35%)	10 (59%)	0	1 (6%)	0
new DAW practices	4 (23%)	9 (53%)	3 (18%)	1 (6%)	0
cultural limitations of global DAWs in terms of musical features	12 (71%)	5 (29%)	0	0	0
access limitations of global DAWs in terms of economic and banking aspects	8 (47%)	5 (29%)	3 (18%)	0	1 (6%)
learning challenges of global DAWs in terms of languages and education access	7 (41%)	9 (53%)	1 (6%)	0	0
relationships between music production and local/international politics	4 (23%)	10 (59%)	2 (12%)	1 (6%)	0
Critical Listening and Technical Ear Training (TET) (n=12)					
new methods to improve my artistic listening skills	4 (33%)	5 (42%)	1 (8%)	2 (17%)	0
new methods to improve my technical listening skills	6 (50%)	3 (25%)	1 (8%)	2 (17%)	0
the purpose of training my ears to become a better audio engineer	8 (67%)	2 (17%)	2 (17%)	0	0
the limitations of TET modules to become a better audio engineer	8 (67%)	3 (25%)	1 (8%)	0	0

to allow for the dissemination of best practices in academic publications. In both sessions, the integration of research methods to the workshop proceedings will be explicit and communicated to attendees.

SSHRC funding and in-kind contributions from partners allow us to improve our EDI efforts to support the participation of representatives of marginalized groups within audio. We will offer equitable and fair payment to all invited presenters from the industry to combat a situation that persists, where there is low or no remuneration for presenters at academic events, thus privileging the participation of those who are well established and can afford to donate their time. The SSHRC budget also includes travel expenses, accommodation, and meal per diems for ULeth students who wish to attend the in-person sessions at the UVic. Finally, two undergraduate and one graduate students from UVic will be hired to assist with the planning and hosting of the 2021 edition, and two undergraduate students from ULeth will be hired to edit the videos of some workshop sessions.

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