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Alternative Pedagogy in the Banff Practicum: Promoting Non-formal Learning, Diversity, and Excellence in Audio Education

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ABSTRACT

This paper examines the alternative pedagogy of the Audio Recording Engineer Practicum of the Banff Centre in Alberta, Canada that hosted up to nine participants per semester until the onset of the COVID-19 pandemic. Developed by Theresa Leonard for over two decades, this program is known to have achieved gender parity in its international recruitment and is recognized as a world leader in music production vocational training. We detail the background of 13 out of the 29 participants who attended the practicum in 2018–2020, under the leadership of James Clemens-Seely. Also, we elicit the teaching strategies of the program based on feedback gathered from 24 participants in five focus group sessions at the end of their residency, along with semi-directed interviews of the main program leaders. Our findings highlight the effectiveness of teamwork assignments that bring sound practitioners who represent different gender identities and a range of nationalities to learning by doing in commercial recording studio settings. Finally, we discuss how the strengths of the Banff Practicum could inspire mentors and educators to reinvent the internship model and enhance the curriculum of formal audio programs.

1 Introduction

This study aims to survey the recruitment, teaching strategies, learning outcomes, and social climate of the Audio Recording Engineering Practicum[1] that was taught until the COVID-19 pandemic in recording facilities that are on a par with those of the most renowned audio and music production programs worldwide, ranging from recording studios based on diverse digital audio workstations (DAWs) and plugin libraries to large-format console desks, with access to large room acoustics, a collection of high-end microphones, instruments, *boutique* analog signal processing devices, and spatial audio monitoring systems. Dating back to 1984 as a Sound Internship, this program was established at the Banff Centre for Arts and Creativity, a Canadian higher education institution without transcript or diploma located on Iinii Istako, also known as Tunnel Mountain, in the Canadian Rockies, in the first nation territories of Iyârhe Nakoda Nations (Bearspaw, Wesley, Chiniki), the Blackfoot Confederacy (Siksika, Kainai, Piikani),

[1]https://www.banffcentre.ca/programs/audio-recording-engineer-practicum/20200511

Fig. 1: Theresa Leonard in front of the Avid System 5 digital console in Luscar Control Room.

and the Tsuut'ina (Ktunaxa, Secwépemc, Mountain Cree, and Métis). This unique institution nestled in a scenic environment distinguishes itself from renowned university art programs by focusing on mentorship while continuously hosting highly skilled artists from around the world who visit for residencies, public performances, exhibitions and conferences and festivals.

The reputation of the Banff audio program grew over the 20-year tenure (1995-2016) of Theresa Leonard (Figure 1), who coordinated recording artist residencies, sound post-production opportunities for visual media, faculty masterclasses, research with academic and industry partners, and professional seminars,[2] including the 24th AES International Conference on Multichannel Audio in 2003. First hired as a staff recording engineer in the Media Arts Audio Internship program in 1990, Theresa progressed through leadership positions, from Production Manager in 1995 to Director of Audio - Music and Sound in 2003, which positioned Audio as equal to Music in the institution until the program became part of Film and Media in 2010. Appointed as Senior Recording Engineer in the Media & Production department in 2017, James Clemens-Seely (Figure 2), who had attended the program as an Associate Recording Engineer in 2008, refined its *learning-by-doing* approach [1] until the onset of the COVID-19 pandemic in March 2020. His ethos aligned with the philosophy and culture of the Centre, consistently expanding the scope of its Indigenous Leadership and Management programs [2].

[2]Partners included Universal Audio and the Center for Computer Research in Music and Acoustics (CCRMA) from Stanford University, California

Fig. 2: James Clemens-Seely positioning the special Neumann M49 microphone (photo credit: Howard Bilerman).

In contrast to most music educational programs and artist residencies of the Banff Centre, the audiovisual educational programs always supported all participants with a stipend[3] that was sufficient to cover their tuition fees, room accommodation and subsistence, and with free access to library loans, gym facilities, and artistic events on campus. This was made possible because these programs were generating income, e.g., from the recordings of concerts, studio sessions, and film scores for the audio program. The pedagogical framework was presented to the clients as an exchange for cheaper studio fees than the market. Although it was made explicit to the musicians that "their professional product [was] also someone's learning experience",[4] this framework required participants to be recruited with enough audio knowledge and professionalism to meet the quality and efficiency expectations of

[3]For the last residency in Fall 2019 - Spring 2020, the stipend corresponded to a per diem of CA$61 in addition to a scholarship of $32.92 per day that covered the tuition fees of the program

[4]Citation from James' ULeth presentation (see footnote 3).

commercial conditions. James[5] explained that it was easy for him to recruit excellent applicants representing diverse gender identities and nationalities thanks to Theresa's promotion of the program in audio schools around the world and through the AES for many years, as well as her explicit encouragement of women and non-binary sound engineers to apply.

1.1 Global research context

In addition to documenting the alternative pedagogy of the program, this survey examines the relevance of its state-of-the-art recording facilities in the late 2010s, when most 'digital native' producers worldwide had learned how to engineer music tracks through watching YouTube tutorials and observing peers' practices in small studios, primarily based on DAWs. Defined by Lucy Green [3] as *informal*, these learning methods were identified as predominant among millennials who successfully DJ and produce electronic popular music in the UK [4]. Nevertheless, outcomes of a grounded ethnography of Bamako *DAW studios* in 2018–2019 indicate that "Malian arrangers/engineers lack less the access to high tech equipment than the access to professional training" [5] in order to meet the mixing and mastering engineering standards that they hope would give them access to the global music market. We therefore assess the teaching effectiveness of the program's mentorship approach in high-end recording settings in enhancing emerging studio professionals' technical skills and capabilities to thrive in the field. We also look at relationships between participants' social identities, audio culture backgrounds, artistic involvement and learning expectations at arrival, and career prospects and learning outcomes when leaving.

The data collection of our survey took place in 2018–2020, a period that challenged "the long-standing 'He-Too movement' in the recording arts" [6], with many investigations denouncing the systemic sexist mechanisms and large spread of "microaggressions" [7] in the workplace that have silenced, marginalized, and excluded women and gender-non-conforming (WGNC) recordists from studios, music production programs, and the audio field at large [8, 9, 10, 11, 12, 13, 14]. In such a hostile social climate, which may explain why WGNC sound professionals comprise a mere 2% of the 252 key technical credits on the 50 most-often streamed tracks on Spotify in 2022 [10], Paula Wolfe [13] advises emerging WGNC artist-producers against attending audio schools to protect their "inner voice". We therefore hope that our critical analysis of the framework and pedagogy of a program that fostered gender identity and geographic diversity while cultivating excellence from its early development will provide educators who are committed to "hold change" [15] with useful information, that may assist them in designing more inclusive curricula and enhancing equity, diversity and belonging through leadership in their institution.

1.2 Critical perspectives on postsecondary audio education in the post-global era

To stay competitive at a time when musical recordings are primarily produced in low-cost DAW studios worldwide [16, 17], the curriculum of postsecondary audio programs that are mostly designed and taught by industry professionals [18] tend to combine different methods of *formal* learning, i.e., tutorials carried out in workstation labs; theoretical lectures and critical listening seminars adapted from the lineage of the European *Tonmeister* tradition [19, 20, 21]; and individual or group recording projects assessed through oral presentations and written report submissions at different stages of production [22]. Although fully equipped recording studios with control and live rooms are less and less in line with the ways popular music is being produced globally [5], audio schools still invest in acoustically treated rooms with expensive hardware equipment to attract students and to encourage "experiential learning" [23] - commonly known as learning-by-doing – in their facilities. For example, Samantha Bennett and Matt Barnes [24] got an AU$255,000 Major Equipment Grant to refurbish the main control room of the Australian National University School of Music and build two new "controlled listening spaces" – one for editing and mixing and the other for mastering – "to promote self-directed learning in post-production" across programs. Similarly, the Banff Practicum features recording facilities that grew over time to provide all participants with enough control and postproduction

[5]James presented the approach of the program at the 'Social Distinction in the 21st Recording Studio' Symposium at the University of Lethbridge on February 14, 2020: https://www.canalu.tv/chaines/afrinum/strength-in-diversity-learning-through-doingin-the-audio-recording-engineer-at-the/ (accessed Feb 22, 2024).

rooms to experiment and advance their technical skills, using a range of analog and digital audio technologies for diverse musical genres and production workflows.

Based on a survey of popular electronic musicians' experiences within Higher Education in the UK, Thompson and Alex Stevenson [25] found that formal approaches to learning subjects such as "audio recording, acoustics and audio engineering" can be "particularly useful in helping to develop production skills, such as mixing and mastering", and that informal and *non-formal* learning methods could enable "more inclusive curricula that acknowledge popular electronic styles". Bridging the gap between formal and informal, non-formal learning methods imply "a clear intention on the part of the learner and teacher to accomplish a particular learning task" [26]. Used to theorize various community music-making activities and one-on-one music lessons around the world, the concept of non-formal learning has been introduced in audio education in reference to peer learning strategies in a project-based environment, in or out of the institution, and for intra- or extra-curricular activities [27, 25]. By identifying which skills are strengthened through which forms of learning methods in the Banff Practicum, we propose to further develop the characterizations of non-formal, informal, and formal learning for the study and improvement of postsecondary audio programs.

To come closer to the professional reality of working in commercial recording settings, and to create links with practices inherited from the analog era, audio educators have proposed innovative teaching strategies that enable students to integrate artistic and technical knowledge in university programs. For example, Kirk McNally and Paul Thompson coordinated masterclasses with renowned British producer Ken Scott and assigned their students to analyse and mix multitracks from analog era archives [28]. Nevertheless, according to Nyssim Lefford [29] who advocates implementing a constructivist learning framework in audio classrooms, to teach students how to listen, make and receive criticisms, "No matter how professional the behavior of teachers while interacting with other teachers, visiting practitioners, and students, school is not a professional production environment." This may explain why audio schools continue to be denigrated by many industry professionals, who have often perceived them as too techno-centric and/or too theory-oriented, failing to convey the communication and inter-personal skills [30, 31], and the high level of emotional labour [32] that musicians expect when paying studio professionals to engineer and produce their tracks. Sound recording program leaders' most common strategy to introduce students to real-life professional experiences consists of incorporating an industry placement such as a studio internship into the curriculum. Drawing upon findings from a recording industry employer survey in the USA, Doug Bielmeier [33, 34] stressed the relevance of studio internships for students to learn recording and production practices within the rules and conventions of the workplace [35] through an apprenticeship model based on observation and on the memorization of gestures and processes [21, 36]. However, studio internships are likely to perpetuate the patriarchal structure of an industry that has systemically excluded WGNC studio professionals [13], and thus there is a need for more comprehensive solutions to de-gender audio education. With this in mind, we analysed individual and collective experiences in the Banff Practicum over a period of two years to examine its recruitment, framework, and pedagogy as an alternative to studio placement and traditional audio education.

2 Survey Methods

2.1 Online questionnaire at the beginning of the Practicum[6]

Thirteen out of the 25 participants who enrolled in the Audio Recording Engineer Practicum between June 2018 and October 2019 filled out the online questionnaire anonymously, on a voluntary basis, a few days after they arrived. These included eight males and five females who were between 24- and 31-years-old with an average of 26 (SD = 1.8). Six of the 13 respondents originated from North America (Canada and the USA), four from Europe (Belarus, Latvia and Poland), and three from Latin America (Colombia and Ecuador). Prior to attending the Banff Centre, eight of them studied in North America (Canada and the USA), three in Europe (the Netherlands and Poland), and two in Latin America (Colombia).

[6]The online questionnaire and focus group session guides were co-developed by AP and James in Spring 2018. Their choice of questions drew upon their own experience of attending the practicum (work-study at the time) in 2007–2008 and how this had impacted on the continuation of their studies and career for the next ten years, and from their awareness of recent research and development in audio education.

Because self-taught sound engineers and music producers could be accepted into the practicum as well as those who graduated from formal audio programs, the first question was broadly, 'How did you learn audio recording?'. Then, to examine the diversity of music production expertise that was represented in the practicum, respondents were asked to define their role and artistic involvement in the music industry, and to specify which musical genres they were mainly producing. We also invited them to detail their musical background, and to list which audio technologies they were most often using to achieve their goals in the recording studio.

2.2 Focus groups at the end of the practicum

AP moderated five focus group sessions with 24 out of the 29 practicum participants whose Banff residency ended between June 2018 and March 2020.[7] During each of the five sessions that lasted between 69 minutes and 124 minutes, with an average of 97 minutes (SD = 23 minutes), AP ensured that all participants had a chance to answer every question. James either partially or fully attended three of the sessions, depending on his work schedule and the desire of the session participants to share some of their experiences without him being present. All sessions occurred within the final two weeks of the participants' residencies, except for the last, which was conducted online, eight weeks after the Banff Centre shut down because of the COVID-19 outbreak. Three sessions were conducted at the Centre during lunchtime, on a voluntary basis, with pizzas and coffee covered by the research funds. Another session happened online due to schedule constraints that prevented AP from coming to Banff before the participants left. All five sessions were fully transcribed by University of Lethbridge students.[8] In the transcriptions, the first name of the participants preceded each speaking turn or reaction, to enable the integration of social identity in the data analysis.

Each focus group was introduced with the question, 'What is the main thing that you learned during your residency?'. Then, we asked the participants how their Banff experience had changed their practice, artistically and technically, and whether it had changed their perception of their role in music production. To collect their perspectives on the future of audio education, we invited them to discuss what would be the ideal audio recording training program, both at bachelor's and graduate levels. We also questioned how they would like to see the audio world evolving.

2.3 Interview of the main program developers[9]

Theresa Leonard's interview lasted 56 minutes and James Clemens-Seely's 59 minutes. While these interviews were primarily intended to complement the data corpus generated by the focus group sessions, they also provided us with insights about the program development that we integrated in the introduction of the paper, and with information about the education background and professional experiences of Theresa and James before, during, and after leading the practicum, which are summarized at the end of this subsection.

The interview guides[10] of Theresa and James both opened with queries about their education background and professional career path before they started working at the Banff Centre, and specifically how they got involved with audio education. While the following five questions in the interview guide for Theresa mirrored those of the focus group sessions, the ones designed for James aimed to further the conversation due to his participation in three focus group sessions, and to enable him to reflect upon the participants' perspectives. After asking him about his pedagogical methods' influences and strategies to teach the social dynamics and skills expected from

[7] Four invited participants were not administered the online questionnaire because two of them arrived before June 2018, and two were enrolled in the Audio Post Production Engineer Practicum but as they regularly took part in the Audio Recording Engineer Practicum's activities, we invited them to join a focus group when they were about to leave. Also, four attendees did not respond to their focus group invitation and one left earlier than planned.

[8] Graduate student Courtney McDermott (CM), and undergraduate students Chris Bernhardt (CB) and Nate Thomas (NT).

[9] The interview of Theresa was conducted and audio-recorded by CM in Victoria, British Columbia in June 2019, and fully transcribed by NT. The interview of James was carried out online and video-recorded by author LM in May 2020, and fully transcribed by CB. CM and LM learnt about the study objectives and methods through each observing a focus group session in December 2018 and May 2020, respectively. They also both attended James's ULeth presentation (see footnote 3) and visited the Banff Centre's recording facilities during a fieldtrip with the ULeth AES Student Chapter in March 2018.

[10] The interview guide for Theresa was adapted from the focus group guide by CM, and the one for James by LM, both were reviewed by AP.

professionals to work in the commercial recording studio, we discussed the value of having access to high-tech studio facilities, such as those available at the Banff Centre, for upcoming generations of sound engineers and music producers. We then explored his impact as an educator and experienced engineer on the career aspirations of the practicum participants. Finally, we asked him to elaborate on the evolution of audio education and its interplay with the wider audio sphere.

2.3.1 Overview of Theresa Leonard's career

Prior to developing the audio educational programs at the Banff Centre, Theresa began her educational career by teaching music in Gander, Newfoundland to elementary students, after receiving her Bachelor of Music degree at the University of Prince Edward Island. Following a degree in Education at St. Thomas University in New Brunswick, she started teaching music in French- and English-speaking schools over a four-year period. She then completed the Master of Music in Sound Recording at McGill. After being a staff recording engineer at the Banff Centre in the summers of 1990 and 1991 and attending the Intern Audio program in the fall/winter months, she was post-production engineer at Salter Street Films in Nova Scotia in 1991 and recording engineer for the School of Music at the University of Iowa between 1991 and 1995. In 1993, she published a paper at the AES Convention [37], and years later she presided the organization (2005–2006).

At the time this paper is being written, Theresa resides in Victoria and is Head of Audio for the Verbier Festival Academy in Switzerland. During her tenure at Banff, she took two periods of leave to be a Visiting Professor at Bang & Olusfen in Denmark (2008) and Visiting Scholar at the Steinhardt School of New York University (2015). Since leaving Banff, she has been the Director of the Edward Stanton Audio Recording Centre at Aspen Music Festival in Colorado, and the School and Executive Audio Producer for the Victoria Symphony. Also, since 2002 she has been a guest lecturer, jury member, and/or consultant for post-secondary audio programs including the Peabody Institute at Johns Hopkins University, the Schulich School of Music at McGill University, Ball State University, the University of Massachusetts Lowell, the Royal Conservatoire in the Hague, the Advanced music production program of the Paris Conservatoire, and the Fryderyk Chopin University of Music in Warsaw.

Over the course of her career, she has produced over a hundred recording projects, including The Gryphon Trio's *Canadian Premieres* (2003), which received a Juno for Best Classical Chamber Ensemble Album. Recently, she has worked on recordings with the Dover and Viano String Quartets, the National Arts Centre Orchestra, the Banff International String Quartet Competition, and Pacific Opera Victoria.

2.3.2 Overview of James Clemens-Seely's career

James Clemens-Seely received a Bachelor of Music in saxophone with a minor in Music Technology in 2008, and completed the same master's degree as Theresa at McGill in 2010. As a member of the AES since 2008, he won three awards at the AES Student Recording competition: first place in Non-Classical Surround Recording and third place in Classical Stereo Recording in 2008 (both recordings he made as a student at the Banff Centre), and second place in Classical Stereo Recording in 2009.

Inspired by his parents' teaching backgrounds, James began his career as an educator working as a lecturer for Recording Arts Canada in 2009-2016 where he taught music production, electronics, audio design, recording, mixing, and mastering to mid-sized student cohorts. In 2013, he began teaching the graduate Technical Ear Training course at McGill. He also acted as a guest lecturer to teach subjects and practices such as sound de-noising and editing, timbral and spatial listening, and distortion.

In parallel to his position at the Banff Centre and following the start of the COVID-19 pandemic, James pursued his career as a freelance sound engineer. He is credited on dozens of productions released on international labels. His film score mixes have won two Canadian Screen Awards (*A Bee's Diary*, 2020; *Equus: Story of the Horse*, 2018 - both mixed at the Banff Centre in collaboration with the practicum program). He won a Juno for Best Classical Album for recording *Early Italian Cello Concertos* (Analekta, 2022) and was nominated for the 2016 Grammy Awards' Best Classical Choral Album, *Steinberg: Passion Week* (Naxos, 2016), and the Juno's Best Vocal Jazz Album, *The Weight of Hope* (Modica,

Fig. 3: María Carolina Rodríguez, alumna from Pontificia Universidad Javeriana in Colombia (photo credit: Anna Blachowska).

2021), Best Instrumental Album, *Then Is Now* (Riverdale Records, 2021), and Best Classical Album, *The Heart's Refuge* (Analekta, 2014). At the time this paper is being written, he holds an Assistant Professor of Sound Recording position at McGill in parallel to continuing his freelance studio career.

2.4 Data coding methods

Applying Kathy Charmaz's qualitative methods of Grounded Theory [38], we analyzed the free-format verbal descriptions of the questionnaire responses and focus group sessions by identifying emerging concepts and themes across questions. This data categorization enabled us to highlight detailed information about the education, audio culture, and music background of the questionnaire respondents, and to identify their roles and expectations in music production. In the following paragraphs, we explain how we used the data analysis software NVivo to code the large data corpus arising from transcriptions of the focus group sessions and interviews.

First, we deductively coded the data corpus into Non-formal, Informal, and Formal learning methods. In this survey, Non-formal refers to learning by accomplishing tasks that trainees are assigned to by a mentor for a project in real-life settings, without having specified guidelines that indicate the steps to accomplish them, but with opportunities to ask questions and to experiment within a timely framework, e.g., improving the placement of microphones based on what trainees perceive following each microphone adjustment (Figure 3). Informal corresponds to a non-structured, indirect, or casual learning activity, e.g., watching a YouTube tutorial to help solve a technical problem. Formal learning is realized through knowledge translation from previously attending theoretical lectures in conjunction with listening seminars, and completing exercises with specific instructions to in-situation applications, e.g., using knowledge on how to identify and analyze harmonies in a European classical music piece to communicating suggestions of chord changes to a band leader during a recording session.

As a second step, we identified 46 concepts that emerged from inductively coding references that we extracted from the data corpus. These references could be coded into more than one concept, in addition to having potentially been coded into one learning method. Throughout the paper, concepts are italicized, with the first letter of the first word capitalized. Whereas the boundaries of some concepts were simple to define, e.g., *Teamwork*, *The value of mentorship and individual guidance*, others required specifications of what was included, for example, *Clients' expectations and studio conventions* associate artistic outcomes with technical gestures to meet audio engineering standards.

To grasp the range of topics that participants discussed, we classified the concepts into eight categories. The first letter of every meaningful word in the category name is capitalized throughout the paper. Four categories directly refer to the practicum, namely participants' Education Background; program Teaching Strategies; program Learning Outcomes; and participants' Negative Experiences. The four remaining categories are related to the audio industry at large, namely Communication; Professionalism; the Recording Studio; and the Future of Audio (Figure 4). To best support our research objectives, the category Recording Studio was broken down into two sub-categories, namely Commercial Dimension and Social Dimension, and includes the *Studio roles* concept. Similarly, Future of Audio consists of the sub-category Future of Audio Education, and the concepts *Sound in the age of noise* and *Gender*. Since the concept *Other notable activities* only included four references about Banff activities that were not part of the practicum, it is not classified into a category and

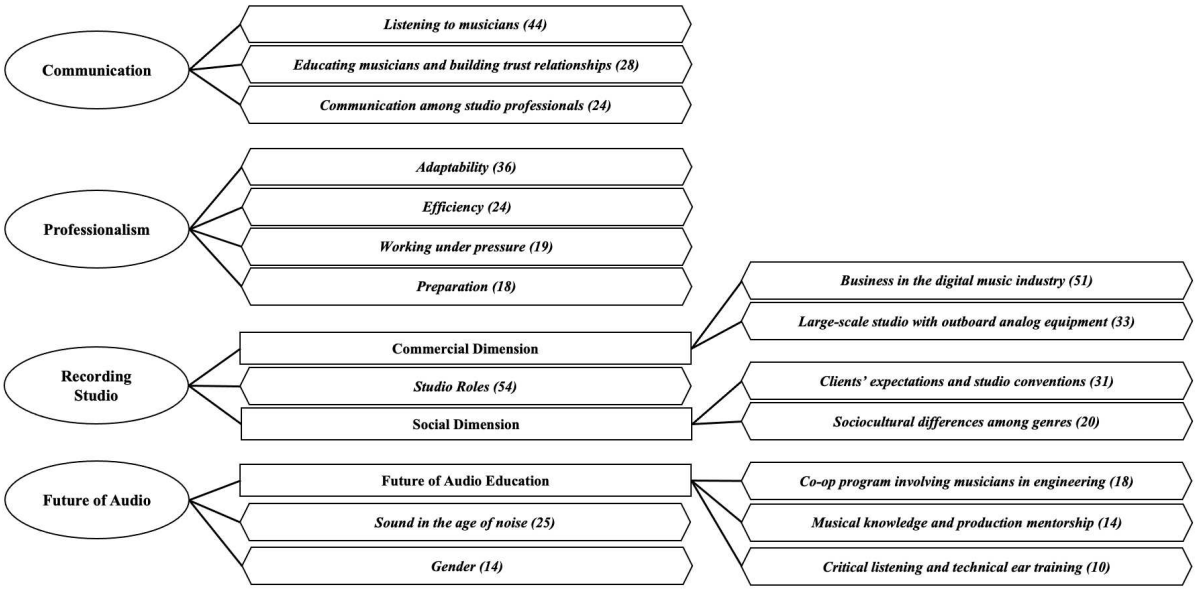

Fig. 4: Coding architecture of inductive categories/subcategories and concepts with the number of references.

therefore does not appear in the coding architecture. Additionally, a meta-category named Positive Reinforcement, consisting of references during the focus group sessions when participants verbally supported each other, was not included.

2.5 NVivo Queries and Results Presentation

We applied NVivo queries to create meaningful visualizations of the main outcomes of our coding. For instance, matrices were computed to highlight the distribution repartition of coded references between the deductive categories, namely Non-formal, Informal, and Formal learning methods, and the inductive categories related to the practicum, namely Education Background, Teaching Strategies, Learning Outcomes, and Negative Experiences. We exported resulting node queries from these matrices as heatmaps to identify the weight of each learning method throughout the participants' learning journey. Also, we provided the number of references that were extracted from the main program leaders' interviews.

Three word clouds were generated to visualize the 50 most frequently used words by the focus group participants and interviewees in the references coded into Non-formal, Informal, and Formal learning methods. This analysis task called for sorting words that were irrelevant to our research questions, i.e., the, and, well, etc., into a stop list. Also, we enabled the 'include stemmed words' option, so that words like 'record', 'recording', and 'recordings' would be consolidated under the same term, with the word cloud featuring the most frequent version in each corpus. It should be noted that the references extracted from the main program leaders' interviewees were included in these word frequency queries.

In conjunction with the deductive and inductive coding of the data corpus, we created cases for each participant of the focus group sessions and for both interviewees. To examine potential relationships between participants' social demographics and their responses, each case was indexed using three attributes: the participant's gender (female, male, non-binary), continent of study (Europe, Latin America, North America), and education background (college, bachelor's in audio, bachelor's outside of audio, master's).[11] When appropriate, we highlighted the most interesting relationships between concepts

[11] For instance, the 24 participants of the five focus groups included 13 females, ten males, and one non-binary person. Whereas eleven originally came from North America (Canada and the USA), five from Latin America (Argentina, Brazil and Colombia), five from Europe (Belarus, Latvia and Poland), and three from Asia (China, Japan and South Korea), 16 pursued their last education programs in North America (Canada and the USA), four in Latin America

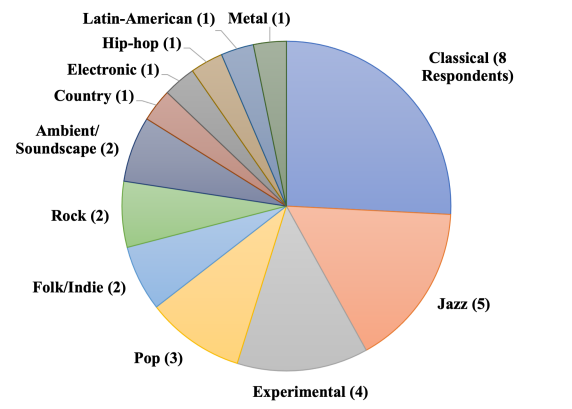

Fig. 5: Distribution of the musical genres with the total of respondents who reported being involved in as a sound engineer and/or music producer.

and their reference contributors' social attributes that we identified from the matrices. Also, the findings section concludes with participants' citations on their experience of gender in the Banff Practicum in comparison to where they studied or worked before.

3 Survey Findings

3.1 Respondents' backgrounds and use of audio technologies

All 13 respondents who filled out the online questionnaire at the beginning of their residency had attended at least one formal audio program, i.e., eleven received a bachelor's degree, one a conservatory degree, and one a two-year diploma from an audio trade school. Furthermore, six had completed or were pursuing a master's degree in a program that built upon the Tonmeister tradition, namely the master's degree at McGill from which Theresa and James graduated, and the Fryderyk Chopin Academy of Music in Poland. Regarding their audio education background outside of postsecondary institutions, six out of the 13 respondents had completed internships, including four in recording studios, one as junior music director and engineer at a national opera, and one as a recording assistant of large events; four had worked as studio assistants; and one had carried out a month-long music festival scholarship. Also, seven specified having gained practical experience performing other audio tasks outside of recording studios, such as working as front-of-house engineers for live events, and three having learned from self-taught experiences such as watching YouTube tutorials.

Figure 5 displays the diversity of musical genres the respondents reported being involved in as sound engineer and/or music producer. We noticed that six respondents named at least three genres, with European classical music as the most mentioned (8 respondents), then come jazz (5) and experimental (4). Twelve respondents received formal training in playing musical instruments; the remaining one identified as a self-taught guitarist and singer in rock, punk, and folk genres. Nine reported on playing the piano, seven the guitar, six symphonic instruments such as the cello or the clarinet, four could sing, and two played the drums. Interestingly, we observed that all 13 respondents reported performing at least one of the following: guitar, piano, or vocals, and that nine reported playing more than one instrument. Seven respondents reported composing their own music.

All respondents reported that they used Pro Tools often, except for one who studied at McGill and who stated that they were the most familiar with Pyramix, specifying, "[I] *prefer clean preamps like Grace's, and DPA, Schoeps*, [and] *Neumann microphones*." Eleven reported regularly using more than one type of DAW, with Pyramix scoring as the second most-often-used (8), followed by Logic Pro (6), Digital Performer (2), and Ableton Live (2). It's worth noting that half of the Logic users indicated their use of the software for composition purposes. Reaper, Sadie, Sequoia, and Wavelab were also each mentioned once. Within the software medium but distinct from timeline-based DAWs that enable editing, one respondent mentioned their use of MaxMSP, another of MainStage, and one of the Dolby Atmos Renderer. We noticed that no respondent listed FL Studio, Cubase, Samplitude, or Nuendo, which are commonly used in underprivileged economic contexts, e.g., in Bamako recording studios [39, 40]. We also observed that all six respondents who had completed or who were pursuing a master's degree used Pyramix and Pro Tools, whereas only two mentioned Logic Pro. In contrast, only two of the other seven respondents reported using Pyramix frequently, including the one who studied at a

(Argentina, Colombia, Ecuador), and four in Europe (Latvia, the Netherlands and Poland). Seven of these participants were pursuing a master's, seven were pursuing or had completed a bachelor's in audio, four were pursuing or had completed a bachelor's in music or other fields, and six attended a trade school at college level.

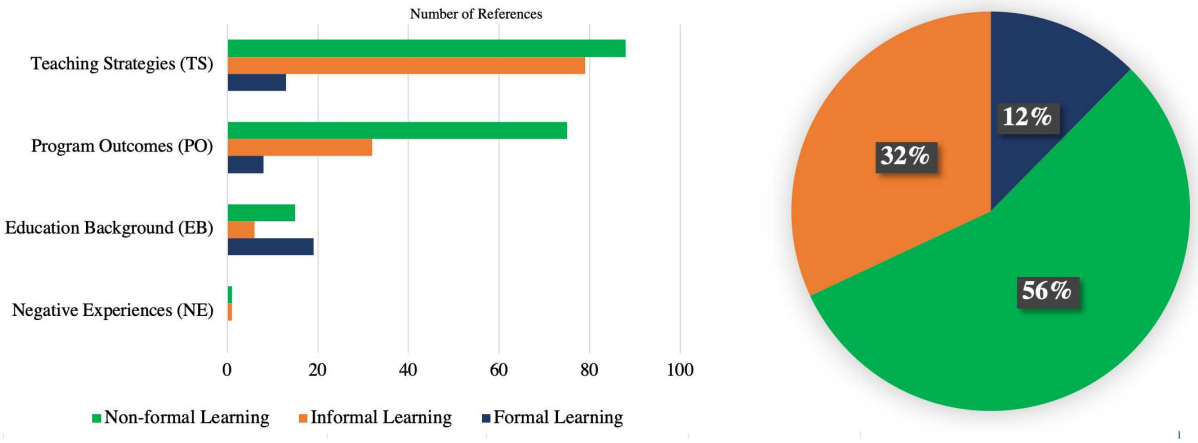

Fig. 6: Distribution of the learning methods in number of references for each practicum-related category (left) and in total percentage (right).

conservatory. Finally, we noticed that all four participants who stated that they were comfortable using analog audio equipment learned through an internship, assistantship, or scholarship.

3.2 Respondents' roles in the music industry, and practicum expectations

Eight out of the 13 respondents listed at least three roles that they played in music production before coming to Banff. Reported roles include recording/lead engineer (11), music/artist producer (6), mixing/editing engineer (5), creator/composer (4), performer (3), studio assistant (1), live engineer (1), sound designer (1), and videographer (1). Notably, one of the three performers shared how their experience in a university music program hindered their self-confidence as an engineer and producer, stating, "*music school made me shy on expressing my musicality. After all the years working as an assistant and as a careful observer and backstage performer for the art, I developed an obstacle with* [. . .] *music. This became a very difficult boundary to surpass when freelancing as an engineer and having the right producer ideas, but not knowing how to tangibly envision them musically and share them.*" Also, the videographer expanded on the indispensability of being capable of more than one role at a time, saying, "*I imagine that trying to manage a life in Toronto exclusively as a young music recording engineer/mixer would be miserable. I sometimes think that I only found myself in a comfortable professional situation because of my abilities to shoot and edit video as well, which enabled me to stay fed while fostering my audio skills.*"

Six respondents elaborated on the roles they would like to play in the future, including recording engineer (3), producer (1), mixing engineer (1), artist manager (1), music director (1), performer (1), and composer (1). Whereas seven noted that they wanted to increase their level of artistic involvement, four stated already being highly involved. Also, five mentioned already working closely with the musicians, and four participating in creative decision-making, for example, "*When I do live off the floor recordings for the radio station, I don't get any notes until I'm done the first mix, and sometimes not at all. In that sense, I had* [a] *license to take a crack at interpreting the musician's work myself. I suppose it was nice to have that trust.*" One respondent indicated that their artistic involvement was usually guided by the musical score, and another one that they were "*actively involved with colleagues from other areas, such as performance, composition, visual and performing arts.*"

3.3 Distribution of the learning methods across Practicum-related categories

Figure 6 shows that overall, Non-Formal is the most represented learning method across the four practicum-related categories with 56% of the deductively coded references. Then come Informal with 32% and Formal with 12%. The Teaching

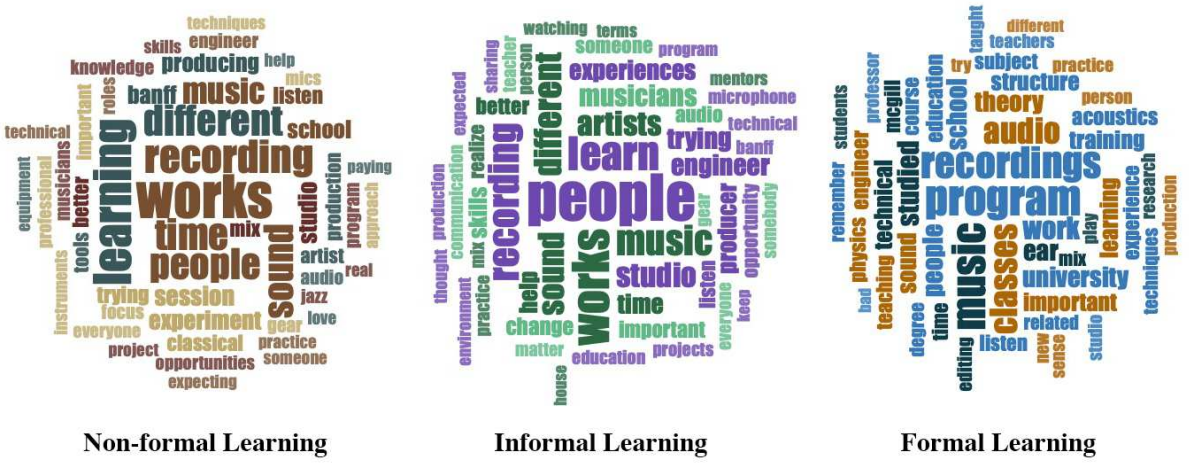

Fig. 7: Word clouds expressing by font size the frequency of the 50 most coded words into each of the three learning methods.

Strategies (TS) category contains the largest number of coded references compared to the other three, with Non-formal (88 references) and Informal (79) being similarly represented. Then come Learning Outcomes (LO) for which the number of Non-formal (75) references largely overcomes those of Informal (32), Education Background (EB) that includes slightly more references for Formal (19) compared to Non-formal (15) and Informal (6), and lastly Negative Experiences (NE), which includes only two coded references into Non-formal (1) and Informal (1).

3.4 Word clouds of the references coded in Non-formal, Informal, and Formal

Figure 7 features word frequency representations for each of the three learning methods. The larger the fonts, the more frequent the word. The most frequent word for Non-formal is 'works', which appears in 2nd position for Informal, and in 6th for Formal. 'Recording(s)' shows in the top four for all three learning methods. While 'music' appears in 2nd position for Formal, it does in 6th for Informal and 8th for Non-formal. It is interesting to note that 'people' ranks first for Informal, 6th for Non-formal, and 9th for Formal. Also, while 'learn(ing)' ranks within the top three for both Non-formal and Informal, it appears in 16th position for Formal. 'Sound' shows in 7th position for Non-formal and Informal, and in 13th for Formal. Finally, 'program(s)' that ranks first for Formal appears in 30th position for Non-formal and 33rd for Informal.

3.5 Interconnections between the learning methods and the Practicum-related categories

Figure 8 complements Figure 6 with a heatmap that highlights the result affordances of the matrix between the number of references coded into the three learning methods and those coded into the 24 concepts that we classified into the EB, TS, LO, and NE categories. In the right column, we added the number of references that were coded into the 24 concepts but not into any of the learning methods. For instance, Figure 8 does not feature the six EB concepts for which no learning method was made explicit, namely *Production, arrangement, and sound design* (9 references); *Performance* (7); *Previous access to a large-scale studio* (7); *Not broad enough* (6) that was only mentioned by female and non-binary participants; *Composition, Theory, and History* (3); and *Learning the DAW* (3).

The predominant TS concept is *Teamwork* (82 references) that was mentioned by 23 out of the 24

Category	*Concept*	Non-formal Learning	Informal Learning	Formal Learning	References not coded in learning methods
TS	*Teamwork*	26 (1)	32 (5)	2 (0)	22 (4)
	Supportive learning environment	19 (2)	13 (1)	1 (0)	21 (3)
	The impact of social diversity and access to a range of learning methods	8 (1)	16 (5)	6 (1)	43 (12)
	Exposure to both classical and popular music genres	15 (0)	2 (0)	1 (0)	13 (2)
	Roles, practices, and workflow from the analog era	4 (1)	4 (2)	2 (0)	13 (3)
	The value of mentorship and individual guidance	6 (2)	4 (1)	0	5 (2)
	Institutional infrastructure and facilities	5 (0)	2 (0)	1 (1)	31 (11)
	Change of career path based on being assigned to different roles	3 (3)	3 (3)	0	1 (1)
	The value of having time to experiment in education settings	2 (0)	3 (0)	0	11 (1)
LO	*Microphone technology, systems and placement*	16 (1)	2 (0)	3 (0)	5 (0)
	Confidence-building, artistic freedom and self-development of skills	11 (2)	10 (2)	0	25 (6)
	Technical ear training & critical listening skills	12 (3)	5 (1)	2 (0)	4 (0)
	Learning more techniques to apply on previous practices	16 (2)	3 (0)	0	13 (1)
	Composition, arrangement, and sound design	4 (0)	4 (0)	0	0
	Network building	1 (0)	4 (2)	2 (1)	21 (12)
	Acoustic recording techniques	5 (1)	1 (0)	1 (0)	3 (0)
	Technical versatility	6 (1)	1 (1)	0	8 (4)
	Mixing techniques & experience	4 (0)	2 (0)	0	4 (0)
EB	*Technical & theoretical knowledge*	6 (1)	1 (0)	10 (0)	2 (1)
	Self-doubt & experiences of toxic learning environments	8 (0)	4 (2)	1 (0)	13 (3)
	Developing a technical ear in an audio program	0	0	5 (0)	5 (2)
	Distinguishing learning in an institution vs. in the industry	1 (0)	1 (0)	3 (0)	7 (0)
NE	*Challenged by working with others and having a boss*	1 (0)	0	0	2 (0)
	Critiques about the Banff Centre as an institution and about the program content	0	1 (0)	0	19 (0)

Fig. 8: Total number of references (with the number of references extracted from Theresa and James' interviews) for each of the practicum-related concepts coded in a specific learning method.

participants, with one emphasizing, "*When [I was] at school I had two recording profs so I only got like, two points of view of approaching of where to place the mics. And here [. . .] you have your mentors and you have your peers who you learn from so you have like, eight different approaches doing things*." Then follow four concepts, namely *The impact of social diversity and access to a range of learning methods* (73); *Supportive learning environment* (54); *Institutional infrastructure and facilities* (39); and *Exposure to both classical and popular music genres* (31).

The predominant LO concept is *Confidence-building, artistic freedom and self-development of skills* (46), then follow *Learning more techniques to apply on previous practices* (32); *Network building* (28); *Microphone technology, systems and placement* (26); and *Technical ear training & critical listening skills* (23). Interestingly, while most of the learning references coded into *Learning more techniques to apply on previous practices*; *Microphone technology, systems and placement*; and *Technical ear training & critical listening skills* refer to Non-formal (16, 16, and 12 respectively), those coded into *Confidence-building, artistic freedom and self-development of skills* are almost equally spread across Non-formal (11) and Informal (10) and were contributed by 10 out the 14 female and non-binary participants.

The two most EB coded concepts are *Self-doubt & experiences of toxic learning environments* (26) with a 2:1 spread between Non-formal (8) and Informal (4), and *Technical & theoretical knowledge* (19) with almost twice as many learning references coded into Formal (10) than Non-formal (6). The predominant NE concept is *Critiques about the Banff Centre as an institution and about the program content* (20) that was expressed by five out of seven participants who had access to a master's program and only three of the 14 who did not.

We noticed that all references coded into TS' *Change of career path based on being assigned to different roles* (7) were extracted from Theresa and James' interviews. For example, after reflecting upon his understanding of woodwind players' challenges during a session thanks to his past experiences as a saxophonist, James stated, "*my awareness of something outside of my role helps me execute my role*". He then went on explaining why learning studio techniques such as using large-scale consoles or splicing tapes might be informative for every studio practitioner. Also, the most predominant concepts that emerged from Theresa and James' interviews include *The impact of social diversity and access to a range of*

learning methods (19); *Network building* (15); *Institutional infrastructure and facilities* (12); *Teamwork* (10); and *Confidence-building, artistic freedom and self-development of skills* (10).

3.6 Gender experiences

When asking the question about the future of audio, a female participant spontaneously replied, "*I want more ladies, I mean The Banff Centre was awesome because this was honestly the first time I got to work with any ladies like when I went back to school, I was the only female even looking at music technology and all of my mentors were men*". Nevertheless, she later expressed her disappointment that beside Theresa and AP, all the guest faculty were men.

In response to an explicit mention of *Gender representation* (17) in another session, a female participant exclaimed, "*Yeah what surprised me when you started to this last section, is that coming here, I completely forgot how it is to be a woman in audio. It completely skipped my mind that this is a problem because here, I just forgot it* [...]. *It's amazing. 'Don't touch the microphone, you're a girl'. Stupid things like that.*" A couple of participants stated that they were seeing a change because their program at home now included more women. However, one of them reported, "*I did find this masculinity part very troubling in my* [...] *education. Especially in* [his country] *which is very masculine-centered culture, and which is very scared of any displays of non-masculinity in men. Of course, many people would tell me there's an excuse for being just looked down on for other reasons, but I would very often feel that I am looked down on because I am not the right kind of masculine, and I was actually hesitating whether I want to do this precisely because*[...] *I wasn't living up to the stereotype*".

4 Discussion

The questionnaire findings indicate that the Banff Practicum mostly recruited participants who had attended one or two postsecondary programs, who had learned their knowledge and skills through diverse avenues, and as a result knew how to use DAWs such as ProTools and Pyramix, and other audio technologies that are commonly accessible in privileged contexts. Interestingly, respondents who reported the highest number of academic qualifications also stated that they were self-taught in audio, which suggests that to stay relevant, postsecondary audio programs in the post-global era would need to focus on complementing the knowledge and skills that can easily be gained through informal learning methods.

The respondents' tendencies to perform several instruments, handle numerous roles in the music industry, and engage in multiple genres attests to their passion for music and sound, and dedication to their career choice. Likewise, the multidisciplinary background and career path of the main program leaders inform their high competency to foster excellence while enhancing diversity, equity, inclusion and belonging in the field. On the one hand, these observations should encourage program leaders to give as much value to the academic background and teaching experience of the faculty they recruit as they give to their industry achievements. On the other hand, they indicate that the survey outcomes would be tricky to replicate in institutional contexts that cannot be as selective as the Banff Practicum, therefore calling for an adaptation of its alternative pedagogy to the level of education and motivation of the learners.

Our analyses of the data corpus that associates the transcriptions from the focus group sessions with those of the semi-directed interviews underline the effectiveness of the non-formal learning-by-doing approach that was established by Theresa Leonard and refined by James Clemens-Seely. Indeed, findings show that this approach successfully integrated with the informal learning methods that digital native producers tend to apply and circulate, regardless of their education and cultural background. For instance, we observe high interconnections between non-formal and informal learning for the concepts of *Teamwork* and *Supportive learning environment* that came up as the two most reported Teaching Strategies (TS), and *Confidence-building, artistic freedom and self-development skills* as the second most reported Learning Outcome (LO). These observations concur with *The impact of social diversity and access to a range of learning methods* that came up as the third most reported TS and was primarily associated with informal learning and participants' positive experiences from the task of handling different *Studio roles* without hierarchy. Together, these findings support the claim that the practicum provided all participants, regardless of their social identity and

education background, with a safe and collaborative learning environment to bridge their knowledge gaps.

Examining how non-formal learning interacts with the high level of formal education that some participants had access to, we observe that *Microphone technology, systems and placement* – which came up as first LO – and *Technical ear training & listening skills* – which was third – primarily intersect with non-formal learning and are commonly taught through a formal structure, combining theoretical, listening and hands-on sessions, in audio schools. Similarly, *Learning more techniques to apply on previous practices* – as fourth LO – mostly associates with non-formal methods, and the high number of references that were inductively coded into *Communication skills*, *Professionalism*, and *Adaptability*, demonstrate the efficacy of the Banff Practicum pedagogy to convey best commercial studio practices while providing participants with a creative environment in which to experiment and learn new approaches.

Whereas the countries of origin and countries of studies of the practicum participants confirm that the program recruitment was international, no country of Africa was represented. We know from the main program leaders that there had never been any applicants from Africa until Issa Traore, also known as Ken Lagare [40], from Mali, who was a participant of our research partnership, attended the practicum from October 2019 until the onset of the pandemic. Two years later, James taught critical listening and mastering to 24 Malian sound professionals including Ken in an audio workshop at Tadiazt Association in Bamako [41]. We truly hope that the practicum can soon reopen under good conditions, and that we will be able to give access to more highly motivated sound professionals from West Africa and other underprivileged contexts to Banff.

5 Conclusive thoughts and future directions

In addition to its audio education contribution, our survey pays tribute to the hard work of Theresa Leonard who developed the practicum in parallel to progressing in status and responsibility within the Banff Centre, thereby illuminating a possible path for sound recording and music production program leaders who aim to overcome the economic inequalities of Audio vs. Music programs in postsecondary institutions. We hope that our analysis of the alternative pedagogy of the program will provide audio scholars with theoretical insight and practical solutions to confront systemic sexism and racism in our field.

Adapting the non-formal learning-by-doing approach of the practicum in postsecondary institutions is challenging because it is generally unfeasible to ask musicians to pay for their recording sessions in a school. Nevertheless, it may be possible to coordinate studio residencies with professional musicians by establishing a reciprocal arrangement involving the artists' time in exchange for complimentary recording sessions conducted by students under the guidance of a teacher. This approach upholds the communication principles that respect the artists' focus and creativity without perpetuating the patriarchal tradition of the analog studio [42]. As another example of non-formal learning integration in a postsecondary audio program, we would like to mention a course designed by Wells Gordon during the pandemic that enabled students to produce and engineer cloud-based work through the EngineEars[12] and Arts Laureate[13] business models and applications, also providing them with a safe environment to gain experiential knowledge in commercial settings that depart from the analog studio tradition [43].

The relevance of the alternative pedagogy of the Banff Practicum until 2020 calls for further research on pedagogical approaches that would complement informal learning while cultivating more diverse opportunities for more students to experiment and learn new techniques in postsecondary programs. Such research will require audio scholars to engage in interrogating the toxic aspects of our traditions [19], such as deconstructing "gendered (mis)perceptions" while remedying materiality and social capital inequalities to reduce the gender gap in the industry [6].

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[12] https://engineears.com/
[13] https://www.artslaureate.com/

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