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Emmanuelle Olivier, Amandine Pras

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De-fetishizing audio signals and technologies in Bamako (Mali)

Amandine Pras^{1,2}, and Emmanuelle Olivier^{2,3}

¹ School of Arts and Creative Technologies, University of York, Heslington, York YO10 5DD, United Kingdom

² Centre Georg Simmel, The School for Advanced Studies in the Social Sciences, 54 Bd Raspail, 75006 Paris, France

³ French National Centre for Scientific Research

Introduction

“I had already worked with DAWs. Actually, we have similar DAWs here. And it’s like there were hidden aspect that we didn’t know about. We work with this equipment, but I’ve discovered so much about its true face here”¹. (Amadou Traoré, apprentice at Afrika-M Record)

Based on an ethnography of South African recording studios in the 1990s, Louise Meintjes describes the large-format studio as “an enclosed space, a dark-bounded interior, a private space with a secret life” that is separated from the outside world [1]. She denounces the fetishization of complex hardware and overuse of jargon that exclude non-specialists from participating in “the nerve center of the creative process, the mad scientist, the head of the industry, which ‘you’ll never be able to figure out by observing’”. When conducting our ethnography of Bamako recording studios in 2018-2019 [2][3], we appreciated the openness and humility of the ‘DAW studios’ where we were welcomed to film complete production sessions. At the same time as we identified

creative uses of globalized audio technologies, we noticed gaps in the knowledge of acoustics and in certain technical skill that were amplified by the fetishization of studio artistry and sound engineering tips on the web. In response to Malian DAW practitioners’ demands for an access to professional audio training locally, we coordinated a workshop after the pandemic, in partnership with the Tadiast Association², founded by Malian-Belgian sound technician and stage manager Abdallah Ag Amano and that aims to offer training solutions to develop audiovisual professions and performing arts in Mali.

Referring to Regina Bendix’ grounds “toward an ethnography of listening” to grasp individualistic and transcultural “pleasures of the ear” [4], Meintjes explains how “the studio both houses and (re)produces sounds’ physiological, social, and sensual dimensions.” Aware of the danger of colonizing a recording culture by teaching production workflows and techniques solely on the basis of these being considered best practices in the Global North, we reflected on the findings of our fieldwork in Bamako DAW studios to carefully design the pedagogy and organization of the workshop. Also, AP discussed the content and delivery format of the training sessions with Abdallah, Burkinabe sound engineer and music producer Éliézer Oubda, and Canadian sound engineer James Clemens-Seely who mentored Malian arranger/engineer Issa Traoré aka Ken Lagaré in the Audio Recording Engineer Practicum of the Banff Centre (AB) in 2019–2020.

Local Audio Culture & Education

In Mali, the recording studio professions of arranger, beatmaker, and sound engineer emerged in the early 2000s with the globalization of the digital revolution. A few digital immigrants from wealthy families with access to higher education who were in their twenties at the time invented a recording culture with almost no roots in the analog studio, and with very limited access to professional audio training [5]. The only large-format commercial studio that existed was Bogolan,³ where, to our knowledge, only one African sound engineer, Éliezer, was mentored. When he was resident engineer of Bogolan from 2006 to 2011, Éliézer transferred the knowledge that he gained there from foreign studio professionals to his Malian peers in real time. He thus embodied a new kind of success

¹ “Déjà je travaillais avec les logiciels. Bon, ce sont des logiciels similaires ici aussi. Bon, c’est comme s’il y avait des faces cachées que nous [...] on ne connaissait pas. On travaille avec ces matériaux, mais, les vrais visages de ces

matériaux c’est ici j’ai beaucoup découvert sur ça.” (From an interview conducted by EO on March 4, 2022)

² <https://www.tadiast.org/>

³ Bogolan studio closed in October 2022.

for this first generation, and over the years became a legend of Western African sound. Recipient of the 2022 FAMA (Burkina Faso Music Award), he has recorded and/or toured with all-Malian world music stars, and is locally known as the head engineer of the prestigious Festival sur le Niger in Segou. For all these reasons, he was the first person we thought of hiring as an instructor for the workshop.

The number of DAW studios really started to multiply in Mali with the introduction of 3G in the capital in 2010. Also, the early 2010s corresponded to an increasing access to affordable computers and digital audio equipment locally, and a growing success of electronic popular music genres in the Global South that transformed the Black music soundscape globally. The ‘3G’ or second generation of Malian arrangers/engineers differs socially from the first. It is made up of digital natives who are no longer all from wealthy families, even though most of them have completed a degree at the University, the National Institute for the Arts, and/or the Conservatory of Arts and Multimedia Crafts Balla Fasseké Kouyaté.

Whereas the Conservatory features a well-equipped recording studio funded by the European Union and installed by Belgian sound engineer Benoît Bruwier, audio training is limited to an introductory course, and students are not allowed to use the facilities for their assignments or personal projects. Moreover, the political and security crisis that has strongly affected the country since the *coup d'état* in 2012 [6] has put a halt to the few professional training programs that used to be organized by the international community. In July 2019, AP taught a two-day recording workshop in the Conservatory’s studio to 12 music students including Ken Lagaré who needed to learn how to use ProTools and to route signal in a digital console desk before attending the Banff Practicum (Figure 1). Although the hardware was dusty and the software had not been updated for seven years, everything worked. This experience indicated a lack of institutional interest for and expertise in recording studio practices. It is thus not surprising that most ‘3G arrangers/engineers’ present themselves as self-trained, giving credit to web tutorials as their main means of learning. Nevertheless, in our 2018-2019 fieldwork we observed a community of practice structured by peer-to-peer support for equipment installation and knowledge exchanges complemented by these learners’ ‘visits’ to observe practices in locally-established DAW studios [2][3].



Figure 1. Ken Lagaré surrounded by eight other music students in the studio of the Conservatory

Since 2021, we have noticed that these ‘visits’ have evolved to become formal studio apprenticeships for the third generation of DAW practitioners. Most ‘3G arrangers/engineers’ have started mentoring interns as soon as they have acquired a legitimacy in the local music business. This phenomenon is reminiscent of the traditional studio apprenticeship that is a feature of the hierarchies of commercial recording studio in the Global North [7], although there is no direct lineage that can explain this similarity. Interestingly, while the first generation of DAW practitioners developed their practice outside the authority of the elders with a strong desire for emancipation and the renewal of the local music culture, the apprenticeship of the younger generation is grounding a local recording culture while restoring the elder/younger relationships that rule Malian social hierarchies.

When we analyzed complete recording sessions of Malian ‘3G arrangers/engineers’, we observed that they had “developed unique ‘sound sculpting’ techniques based on additive and subtractive MIDI programming instead of relying on digital signal processing such as equalization, dynamic range compression, and automation to reduce the frequency masking of the vocals by the instrumental” [3]. We concluded that they had found a creative way to compensate for the gap in their digital signal processing skills, which worked musically and locally from a business perspective [2], but did not allow them to mix and master Malian productions aimed at the global market. This situation generated a lot of frustration, and they denounced its impacts on the music’s cultural identity. For instance, “adding reverberation on certain recordings of the traditional instrument *n’goni* could be perceived as a lack of respect for a specific spiritual music practice”. On the other hand, they were conscious of their difficulties in achieving the loudness and vocal clarity that they could appreciate in the productions that are mixed and mastered abroad. We thus designed the learning

outcomes of the workshop for Malian sound practitioners to overcome the acoustic knowledge and technical skill gaps that we identified in our fieldwork, without, however, having to compromise their production workflow and creative processes.

Workshop Organization

The workshop was held from February 28 to March 5, 2022 in three different venues in Kalaban Coro and Baco Djicoroni areas, namely: Tadiast, which features a large teaching room connected to a small office that we used as a control room, and another office with three iMacs; Moffou Studio owned by Salif Keita that features an Audient ASP80 console desk, outboard analog devices, and Genelec 8050 monitors (Figure 2); and the Blonda, a venue that can host a large number of people. We selected 24 participants, 11 of whom belonged to the network that EO has developed since 2014, and 11 from the network of Abdallah Ag Amano including Marie Joseph Diakité aka Majo DJ. Also, thanks to a collective effort, two more women participated in the workshop, namely Bintou Traoré, a sound technician at Radio Citoyen; and Aminata Coulibaly, a live engineer based in Segou who was trained by Éliézer. Whereas Abdallah had invited several participants from the North to join us, only Ahmed Ag Mamzé from Timbuktu did. All 24 participants received XOF10,000 (\$16.8) of per diem for each day of attendance. Aminata and Ahmed were also given XOF5,000 per night for accommodation and their bus tickets were reimbursed.



Figure 2. Éliézer preparing his session at Moffou

We divided the 24 participants into three groups of eight (Table 1). The first group (G1) included rappers, beatmakers, Majo DJ, and those who were still apprentices or just starting their own studio in their early 20s; the second group (G2) consisted of ‘3G arrangers/engineers’ who were already mentors, most of them in their early 30s, and other professionals of the same age; and the third group (G3) was made up of digital immigrants or elders who belong to the first generation of Malian live engineers and studio owners. From a sociological perspective, it was important to establish these groups based on generations, in a country where youngsters can hardly express themselves in the presence of elders, especially when their opinions differ.

Due to a suspension of direct flights between Mali and many countries at the time of the workshop, Éliézer had to leave two days earlier than planned to engineer a concert of Salif Keita in Guinea, and James could only arrive one day later than planned. Also, Abdallah had committed to work for Les Mixités Festival the same week. The timetable was adapted according to all the schedule constraints (Table 2).

Group	First name	Last name	aka	Audio experience
1	Amadou	Dembelé	Mr Pizi	Rapper and owner of Pizi Prod
	Aboubakar	Diallo	Bac Di	Owner of Authentique Studio
	Marie Joseph	Diakité	Majo DJ	DJ
	Soumaïla	Doumbia	Lil Visko	Studio owner
	Abdrahamane	Keita	king on da track	Apprentice at Backozy Beats Design
	Yacouba	Konaté	Hakoum Gniraby	Apprentice at Pap Junior's Studio
	Mahamadou	Soumbounou	Mylmo	Rapper and owner of REG'ART+
	Amadou	Traoré		Apprentice at Afrika-M Record
2	Abach	Coulibaly		Owner of Afrika-M Record
	Aminata	Coulibaly		Live engineer at Festival sur le Niger
	Aboubakar	Keïta	Baba Keïta	Studio owner
	Zackaria	Maïga	Zack	Studio owner
	Issa	Sanogo	Backozy	Owner of Backozy Beats Design
	Siriki	Sidibe		Live engineer
	Bintou	Traoré		Sound technician at Radio Citoyen
3	Issa	Traoré	Ken Lagaré	Studio owner
	Ahmed	Ag Mamzé		Live engineer

Djoman Joseph	Akre	Scotty	Owner of Bama Art studio & live engineer
Sekou	Bah		Studio owner and live engineer
Souaibou	Cissé	Anane Sy	Live engineer and TV sound technician
Oumar	Diallo	Barou Bléni	Studio owner and live engineer
Kouassi	Konan		Studio owner and live engineer
Oumar	Konaté		Studio owner
Aboubakar	Simaga	Baba Simaga	Studio owner

Table 1. List of the 24 workshop participants divided into three groups

During a pedagogical meeting on February 13, 2022, whereas Abdallah and Éliézer emphasized on the needs for Western African sound practitioners to learn more from the practice than the theory, James and AP explained how they integrate a range of learning resources into their teaching [8]. James asked whether he could be sent recordings from West Africa to use as examples for the Technical Ear Training (TET) modules [9], and participants' mixes to prepare for his mastering sessions. Before the workshop, AP collected two mixes from the G1 and two from the G2, and created three excerpts of *calabash*, *jembe*, and *kora* from a recording session at Bogolan engineered by Éliézer, which James attended when he had just flown in Bamako. She updated the slides that she had prepared for an audio workshop in Saint-Louis, Senegal, in June 2021. She also coordinated an online training session for Abdallah with Sam Fisher who kindly offered four licenses of SoundcheckPro⁴ to install on the three iMacs and a laptop computer at Tadiatz.

On the first day, Éliézer introduced the workshop with general information about signal flow and

acoustic isolation to two groups of 12 participants, one mostly constituted of live engineers (Figure 3) and the other of studio professionals. During the next four days, each of the three groups attended four 3-hour sessions, i.e., Studio Techniques, Acoustics and Microphone Technology, TET, and Mastering; and two 1.5-hour sessions in half-group, i.e., Signal Flow, and Mixing. Deliberately, Mastering came after Mixing, which came after Acoustics and Microphone Technology for each group, to guide the participants through their learning of gain staging and frequency balances in the chronological order of the different stages of studio production. The schedule enabled James to observe one of Éliézer's sessions and vice versa (Figure 4). AP taught an additional session with the three women participants to offer them a safe space to review what they might have trouble grasping. On the last day, James and AP carried out a Q&A session with all the participants before EO facilitated a round table about the development of audio education with representatives of the Ministry of Culture, the BUMDA (Malian Copyright Office), and the Conservatory.

Date, Time	Stations iMac - Tadiatz	Live Room - Tadiatz	Control Room - Tadiatz	Moffou Studio
Feb 28, 10am-1pm		Introduction with Éliézer (studio participants)		
Feb 28, 2pm-5pm		Introduction with Éliézer (live engineer participants)		
March 1, 10am-1pm	G2: TET with James	G1: Acoustics & Microphone Technology with AP		G3: Studio with Éliézer
March 1, 2pm-5pm	G1 (half): Signal Flow with Abdallah		G1 (half): Mixing with AP	G2: Studio with Éliézer
March 2, 10am-1pm	G3: TET with James	G2: Acoustics & Microphone Technology with AP		G1: Studio with Éliézer
March 2, 2pm-5pm				G1: Mastering with James
March 3, 10am-1pm	G2 (half): Signal Flow with Abdallah		G2 (half): Mixing with AP	
March 3, 2pm-5pm	G1: TET with James	G3: Acoustics & Microphone Technology with AP		

⁴ <https://soundcheckpro.com/>

March 4, 10am-1pm	G3 (half): Signal Flow with Abdallah	G1: Feedback interviews with EO	G3 (half): Mixing with AP	G2: Mastering with James
March 4, 2pm-5pm	G2: Feedback interviews with EO	Session with AP for women participants		G3: Mastering with James
March 5, 11am-1pm		G3: Feedback interviews with EO		
Blonba				
March 5, 2-3pm	Q&A session with James & AP (all participants)			
March 5, 3-6pm	Roundtable with representatives of cultural infrastructures facilitated by EO			

Table 2. Timetable of the professional audio workshop on February 28 – March 5, 2022



Figure 3. Éliézer teaching to (from left to right) Scotty, Barou, Aminata, Bintou, Oumar, Siriki, Aekou, and Anane Sy in Tadiast's Live Room



Figure 4. James exchanging with Éliézer, and (from left to right) Lil Visko, Hakoum Gniraby, and Bac Di at Moffou Studio

Participants' Feedback

In the following subsections, we present the preliminary outcomes of a qualitative analysis of ten of the individual interviews conducted by EO with 19 of the 24 participants, lasting twenty to thirty minutes each on March 4–5, 2022. After asking those she had not yet worked with about their family and education background, she asked the participants what they learned from most in the workshop sessions, what was challenging for them to understand, and what they would like the next workshop to be like.

Main learning outcomes

Overall, participants reported that they learned the most about mixing and mastering from the sessions dedicated to these topics taught by AP and James, and from Éliézer's studio demonstrations. When EO asked Backozy to elaborate, he explained, "*A track that comes directly from the USA, England, or France, you will see that it's well 'inflated' and that there is no saturation. [...] While trying to 'inflate'*

⁵ "Un son qui vient droit des USA, de l'Angleterre ou de la France, tu vas voir que c'est bien gonflé et qu'il n'y a pas de saturation. En essayant de gonfler le son ici, on tend vers la saturation. Lorsqu'on diminue, on n'a pas assez de volume". (Backozy, G2)

*the sound here, we tend to saturate. When we reduce the effect, there is not enough level"*⁵. They understood that achieving successful mixes and masters requires engineers "*to have good ears to capture certain frequencies and dynamics*"⁶. Some responded well to AP's pyramid visualization of a mix inspired by her mentor Patrick Sigwalt at the Paris Conservatoire, with the lead(s) on top, the rhythmic section at the bottom for support, and all the harmonic filling in between.

Beside mixing and mastering techniques, the primary learning outcome we identified from the participants' feedback is how they could be more flexible when applying audio techniques, why that is so important, and how they should keep enriching their practice by listening to that of others. Commenting on the instructors' pedagogy, Abach stated, "*We must be flexible. That doesn't mean that we need to just follow this. We were shown what this can do; it's your responsibility to enter and work it. You will create your own path in there*"⁷. Also, Bintou shared "*Oh*

⁶ "il faut avoir une bonne oreille pour capter certaines fréquences, et les dynamiques aussi". (Amadou, G1)

⁷ "Il faut être flexible. C'est pas en disant qu'on suit ainsi, bon. On te montre ce qu'on t'apporte ; c'est à toi d'entrer

that's true, I have been here [as a radio technician] for two years and I am blocked in the same position [of microphone setup], it took this [workshop] to change that"⁸. Abach also mentioned that the workshop was more advanced and clearer than YouTube tutorials. Backozy reported that he used to watch tutorials to learn FL Studio, but not mixing. And when he was trying to replicate what he had watched, the results were not satisfying, and he did not know why.

The participants appreciated the instructors' efforts to demystify the tools, processes, and the basic acoustic principles behind the techniques, which helped them understand why they kept having problems. This might mean Baba Keita learning why asymmetric cables should not be longer than five meters, or Zack seeing how to convert an audio track into MIDI in Cubase. Abach underlined how important it was for him that the instructors demonstrated the theory with examples, e.g., when AP moved the snare around to show how its resonance changed depending on its distance to the walls, or on what was above or beneath it (Figure 5). Similarly, Mr. Pizi appreciated that Éliézer used a session with MIDI programming to show them mixing techniques because most of them have not had any experience with live recordings of instruments. Several also mentioned how useful it was for them to learn about the impact of microphone placement, or about easy ways to improve the acoustics of their studio without spending money.



Figure 5. From left to right: Abach, Ken, Backozy, Bintou, Zack, and Baba listening to the snare sound

et tourner. Tu vas créer ton propre chemin dedans". (Abach, G2)

⁸ *"Ah, c'est vrai ! Je suis là depuis 2 ans je suis calée avec la même position. Il fallait faire ça pour changer ça"*. (Bintou, G2)

⁹ *"Je vais essayer de travailler sur moi-même"*. (Abach)

Other workshop's positive impacts

For several participants, this workshop was a wake-up call to spend more time to *"work on themselves"*⁹. They felt empowered and motivated to have the courage to seek more information and learn what they need to so as to be more satisfied with what they do. This awareness primarily came from discovering how much more there was to learn. For instance, Amadou referred to a Bambara proverb, *"The one who says they know everything does not know anything. Knowledge belongs to the one looking for it"*¹⁰. Also, Baba Keita stated, *"These are things that are in the sand, underneath our feet, but that I don't know. I did not know all of this"*¹¹. Similarly, Bac Di said that he *"was doing a lot of things that were not normal, really"*¹². Moreover, Abach realized that what he thought came from not having access to good equipment actually came from a lack of information, a lack of knowledge. For Bintou and Aminata, the workshop revealed their aspiration to engage in studio production as opposed to working as radio technicians or live engineers.

The participants told EO that in the evenings they practiced and researched further the things they had learned during the day. For instance, Amadou asked his mentor Abach some questions about amplification and installation techniques in live engineering that he could not understand at Éliézer's introductory session; Bintou experimented with different microphone placements at her radio station; and Backozy and Lil Visko remixed some of their projects and compared the new mixes with the first versions. All participants also took the opportunity to enhance their network between sessions and at lunch breaks when Northern-Malian food was served on the roof top of Tadizat (Figure 6). For examples, Abach proposed to share plugins with Backozy in exchange for learning the latter's musical style; Aminata asked some of her group members whether they could take her on as an apprentice in their studios; and Bintou asked Aminata to show her what she knew.

Towards the next workshop

Whereas the participants greatly appreciated the workshop, they wished they had more time to go more in depth on some of the topics, in particular

¹⁰ *"Celui qui dit qui connaît tout ne connaît rien. Et : La connaissance appartient à celui qui la cherche"*. (Amadou)

¹¹ *"C'est des choses qui sont dans le sable, sous nos pieds, mais je sais pas. Je savais pas tout ça"*. (Baba Keita, G2)

¹² *"je faisais des tas de choses qui n'étaient pas normales, vraiment"*. (Bac Di, G1)

mixing and mastering techniques. Mr. Pizi shared his difficulty in understanding how to use dynamic range compressors, and Bintou would have liked to spend more time practicing with SoundcheckPro because it helped her to better understand what she does at the radio station. She also expressed her wish to have training sessions for women only to feel more comfortable and less intimidated to ask questions.



Figure 6. Cook Aissata Maiga and her assistant Djeneba Koné serving *zamin* (fried rice and fish)

Instructors' Feedback & Discussion

This section discusses key comments from James' and Éliézer's interviews conducted by AP on October 3 and 10, 2022, respectively, to collect feedback for the AES Convention in New York where both were planned to participate in a panel with us but had to cancel because James had a schedule conflict with a recording in Calgary and Éliézer could not get a US visa. She asked them to describe spontaneously the most special and surprising moments that they could remember, when the participants seemed to engage the most and what they may have had a hard time to understand, whether they would have prepared differently if they had to teach their sessions again to a similar audience, how this experience may have changed their way of teaching, and to comment on the workshop organization.

The most special moment that Éliézer remembered was, *"When we did practical sessions in Moffou Studio, it was great to see how the participants were relaxed, receptive, and interested, how they were*

*asking questions. They really talked about production. [...] And I realize that here [in Burkina Faso] people mostly work with mnemonics and not with their ears. They might see in a tutorial that they should do this and this. Actually, they don't really try to understand why we set compressors this way"*¹³. James was also impressed by the Malians, and stated, *"the simplest way I could put it is as an educator / sometimes academic, the kind of book smarts and theoretical knowledge that a lot of the participants had was like mid high-school level for what I'm used to here [in Canada], but the perceptual precision and musical artistic acuity was higher than PhD level"*. This confirms our previous fieldwork observations that Malian arrangers/engineers could achieve a high level of mastery in their DAW without having had access to professional audio training, and that they were eager to learn more about the theory behind the practice to improve their techniques [2][3]. Their high motivation to learn also manifested itself at the Q&A session for which the participants had written down precise technical questions in advance.

Éliézer continued with, *"And the fun part for me with James was to learn how to listen to the effect of compression. So that the participants know what it does. It's really what has stayed with me and where I would like to go deeper if I get the opportunity again"*¹⁴. He was referring to James' mastering demonstrations that he observed on March 2nd. James reported that in these demonstrations, it was *"pretty engaging for [the participants] to be able to map the sonic changes to specific parameters in a locked-in environment where it was like, 'here is a change, here is how you hear that change'"*. This teaching strategy was reinforced in the TET sessions that gave the participants the opportunity to manipulate the signal processing effect settings on commercial releases of West African productions (Figure 7 & Figure 8). About these TET sessions, James noted, *"seeing how big of a difference there could be with the same parameter change across multiple different musical examples was a bit of an eye-opener for them and it was kind of exciting for me to see them engaging with that"*.

¹³ *"Moi c'est quand on a fait les séances pratiques au studio Moffou. C'est de voir comment les gars ils étaient détendus ils étaient réceptifs et comment ils étaient intéressés. Ils posaient des questions, ils parlaient vraiment de production quoi de. [...] Et je me rends compte que par ici les gens bossent beaucoup avec des moyens mémo-techniques et pas avec leurs oreilles. Ils ont vu dans un tuto qu'il faut faire ça ça ça ça, et au fond ils cherchent pas trop pourquoi les compresseurs on les règle comme ça"*.

¹⁴ *"Et la partie cool c'est avec James c'est aussi tu vois apprendre à écouter l'effet de la compression pour qu'ils sachent ce que ça fait. Moi c'est vraiment le truc que j'ai retenu et que j'aimerais approfondir si l'occasion se représentait. Moi-même pouvoir faire des séances avec James ou avec quelqu'un d'autre. Tu vois approfondir ça. Je sais que c'est très important ce truc"*.

Interestingly, both James and Éliézer shared their surprise about the fact that *“there was kind of a consensus in what the smart tactics are despite wildly different contexts, wildly different backgrounds, and just seeing that if our end goal is the same, a lot of the process evolves naturally to also be the same”* (James). From his perspective, Éliézer explained, *“What surprised me the most was to see that James, who is a professional, a professor, has a lot of similar ways to address mastering. Not to put a strong limiter, instead to do it in several steps to gain a bit more loudness every time. That’s something I was doing naturally; I could not explain it. I just thought it sounded better this way. And then to see someone who is a professional explaining why. Putting myself in the shoes of the participants, it was very empowering”*¹⁵. For James, observing their common technique *“to make it bigger without actually making it louder but smaller”* validated his own approach: *“that was really beautiful to see and sort of re-affirming for me and my own processes because sometimes our processes don’t make any sense and are evolved based on whacky mutations and historic contexts that are no longer relevant”*.



Figure 7. Backozy and Zack practicing TET

James mentioned that he needed *“to really explain some bare essential elements and sort of build with the participants the building blocks for understanding it”*, which would give them *“the tools to come up with [their] own recipes”*. He also felt useful when *“giving them the language to explain the [acoustic] phenomenon that they observed”*. For Éliézer, the success of his pedagogy lies in asking the participants what they want to know at the beginning of each

session, and in addressing every topic from their local reality. He believes that the demonstration of his *“less is better”* technique was the most convincing part of his sessions for the participants: *“I saw sparks in their eyes, they really enjoyed the fact that we could, with little process, achieve a result that they would usually get to with tons of stuff”*¹⁶. Then, he was pleased that several participants shared with him some weeks after the workshop that they could create *“more digestible sounds”*.



Figure 8. Barou, Scotty, and Anane Sy at the TET session

Éliézer noticed that participants were challenged to understand what they could not hear, i.e., digital audio theory. He suggested that this could partly be explained by the lack of access to good sound interfaces and monitoring systems, which prevents them from hearing differences in sample rate or bit depth conversions. This limitation, with a lack of access to accurate information, may have contributed to make audio engineering mysterious to them. In the same vein, James acknowledged that *“it took a little while to map in a meaningful way what they were doing in this ear training environment to their work lives”*. If he had to teach this workshop again to a similar audience, he would spend more time associating effect settings with their sonic result, and he would touch on loudness norms. Also, he would like to teach sessions with musicians, which is something that we had originally planned to do with the soundchecks of Les Mixité Festival but had to abandon due to schedule constraints. On another note, Éliézer shared that he tried to replicate James’ mastering approach in a workshop in Ouadagoudou.

¹⁵ “moi le truc qui m’a le plus surpris c’est de voir que James qui est un professionnel, un professeur, on a, il y a beaucoup de similitudes dans la façon d’aborder le mastering. Sur, déjà, le fait de [...] pas mettre genre une grosse limitation, plutôt de le faire sur plusieurs steps et à chaque fois gagner un peu plus en volume. C’est quelque chose que je faisais naturellement. Je ne me l’expliquais pas. Je trouvais juste que ça sonnait mieux comme ça. Et le

fait de voir quelqu’un dont c’est le métier, expliquer pourquoi les choses. Et je me mets à la place des récipiendaires c’était très enrichissant”.

¹⁶ “j’ai senti les étincelles dans leurs yeux quoi, ils ont vraiment kiffé le fait qu’on arrivait avec beaucoup moins de process à atteindre un résultat qu’eux faisaient avec une tonne de trucs”.

Both Éliézer and James validated our approach to the division into three groups, and we noticed that the studio assistants of G1 talked more during the workshop sessions than they do when we meet them with their mentor. Éliézer acknowledged that he proposed different activities to each group because he could tell that they did not have the same level or type of experience (live vs. studio). James commented on the fact that the G2 (mostly constituted of ‘3G arrangers/engineers’) was “*in a sweet spot for ability to understand with sophistication, but willingness to learn and adapt and change*”.

Future Research & Education Projects

When we went back to Bamako from February 18 to March 5, 2023, we visited seven recording studios owned and/or operated by four G1 and four G2 participants of the 2022 workshop. AP was delighted to see that all the vocal microphones were placed in a way that avoided reflections from glasses and other hard surfaces, and that all the vocal booths had been effectively treated based on the acoustic principles that were taught during the workshop. However, when she coached three G1 and three G2 participants in one-on-one mixing sessions, she observed that the techniques to set an equalizer and a dynamic range compressor, or to balance sources to create a mix that would translate into a large range of monitoring systems needed to be re-explained. In some cases, she heard vocals that were recorded with saturation due to high preamplification levels. She also grasped that they all seemed challenged by the meaning of sound level units that were introduced during the workshop, e.g., dB_{SPL}, dB_U, V.U., dB_{FS}, and LU_{FS}. Since then, she obtained funding with Prof. Jude Brereton at the University of York to design a sound app that aims to facilitate self-taught studio professionals’ understanding of gain staging and sound levels. This app is part of the resources that will be developed and tested for the pilot of the AUDIO4ALL’s virtual learning environment, whose purpose is, among others, to provide solutions to the near absence of professional audio training in Mali.

For our two weeks of fieldwork, we hired Aminata to assist us in the filming and recording of studio sessions. In her post-workshop interview, Aminata shared with EO that she had never been paid for her work in the live engineering team of the Festival sur le Niger, despite having been given the responsibility to train new team members who would then become her superiors. After she won the best technician award at the Abidjan Market for Performing Arts (MASA) in 2018, she requested payment and involved her

husband in the negotiation, but her boss refused. She has kept a good relationship with Éliézer and went to greet him every year when he was training the team the week before the Festival, but the rest of the team has kept ignoring her. Her experience echoes the harsh level of gender discrimination that women in audio face globally [10], amplified by local social inequalities and the near absence of work policies or access to legal support for a profession for which there has not been any formal recognition, federation, or union locally to date. Whereas we cannot change the situation from an institutional perspective, we have included Aminata in a team of four Malian studio professionals who will be paid to coordinate the testing process of the AUDIO4ALL pilot in the coming months. We hope that this will give her the opportunity to learn with and from her team members, so that she can realize her goal of creating a studio in Segu.

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