7.4 Case studies for a possible sonic lab. Hugh Davies' DIY and hacker methodologies

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× Abstract

One example and a case study of this research is the Electronic Music Studio. Although sound studios are not generally named labs, most of the practices developed are related to laboratory practice. According to Jussi Parikka (2016: 81), "the studio (as in artistic creativity)" is a place where to practice "the method of invention" (Parikka, 2016: 81), which is essential for the functioning of the lab. Therefore, I feel legitimated to include the EMS in this study. Following this, the research will examine how studios adopt experimental methodologies and defy a hegemonic definition of the laboratory. Studying these methodologies and focusing on sonic practices developed in an academic lab environment will be helpful to define and establish the concept of a sonic laboratory.

Keywords: DIY, hack, hacklab, artist.

1. DIY and handmade practices

In this research, I want to focus on artists' methodologies related to laboratory practice. To this end, I will produce a case study of Hugh Davies, a pioneer in DIY and handmade practices, which is exemplary for this section. Davies's methodologies characterise what hacklabs and other labs from the 90s will develop and focus on through their practice. Of course, I refer to DIY and handmade practices that are nowadays developed in hacklabs as a critical methodology. However, these appear to be central in Davies's practice during the 60s and 70s, even before hacklabs existed. In this way, Davies' practice is pioneering hacklabs methodologies using DIY, hands-on, learning by doing, and building self-built instruments.

2. Davies's practice is influenced by laboratory environments

Hugh Davies was a sound artist who helped and contributed to developing the Electronic Music Studio. According to the authors,

> *In autumn 1967, Hugh Davies, following his two-year tenure in Germany as Stockhausen's assistant, proposed the establishing of a Goldsmiths electronic music studio to Stanley Glasser, who was soon to be Head of the Music Department. By January 1968 the 'Electronic Music Workshop' had begun evening classes. (Young et al., 2008, p. 1).*

The archival material and the papers that contributors and authors have written about EMS explicitly highlight the processes of acquiring resources such as synthesisers, computers and other devices to build up the studio as a place where engineers, artists and researchers could work with sound. The EMS had, on the one hand, this technical aspect of developing sound and music. However, on the other, the studio was one

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of the first academic institutions to teach experimental music, with Hugh Davies leading the EMS from his experience learned with Stockhausen. In other words, “This, by a small margin, was the first such facility in any institution of higher education in Britain” (Young et *al.*, 2008, p. 1).

Probably the context of the EMS, seen as a laboratory, influenced Davies’ practice. 1967 was the foundational year of the EMS at Goldsmiths, University of London. That is when the Head of Music, Stanley Glasser, approached Davies to set up the EMS. Just back from Cologne, Davies, at Goldsmiths, set up one of the first educational institutions in Electronic Music. According to the author, “He became the inaugural studio manager of the new Electronic Music Workshop - a position that enabled him to acquire further equipment that he could not afford to purchase personally, including three high-quality stereophonic tape recorders, one of which Davies modified.” (Mooney, 2017, p. 7).

The EMS was not only an engineering sound studio, but it was a place dedicated to research and teaching experimental electronic music. This tendency of including experimentation into an academic institution was pioneering in Britain. The methodologies applied to the teaching and research were fundamental to understand the EMS as a possible model for the formulations and definitions of an alternative view of the laboratory. For instance, the authors state, “They emphasised the importance of students doing practical work” (Sound on Sound, 1987, n/p), and continue “The students, who included three up-and-coming composers Don Banks, Anthony Gilbert and David Lumsdaine, had one lecture each week and a practical session every fortnight.” (Sound on Sound, 1987, n/p).

Consequently, the practical work was mixed with more theoretical lessons, and this gave the EMS an aesthetic dimension that contributed to enlarge the studio’s technical capabilities. Not only theory, practice and technical resources confirmed the basis of the studio, but Davies’ experimental capabilities. Learning from the great experimentalists in electronic music in Europe, Davies contributed to developing the studio in what can be said today as the methodology of learning by doing. As the authors boldly put it,

Hugh Davies was well informed on the history and repertoire of electronic music, but his practical experience was very limited. He chose equipment because he was familiar with it and other composers had used it. He managed to keep a few steps ahead of his class in technical matters by learning from the equipment as he went along.

(Sound on Sound, 1987, n/p).

The EMS activities were a remarkable achievement in technical development, practical and theoretical teaching and research activities, and the creative activity of their researchers and students. However, another significant aspect of the studio is Davies’s experimentalism in researching and his possibilities for developing instruments. In addition, Davies’s DIY influence towards the EMS helped develop creative skills in instrument building for some of their students. For example, “The members of one of our several evening classes also constructed a 32-channel sequencer for the studio.” (Sound on Sound, 1987, n/p).

By highlighting the teaching features, building technical resources, and developing creative skills, the EMS contributed aesthetically and technically in developing what this research is investigating, especially as an alternative view of the laboratory. The idea that studios can be equated to laboratories contributes to present the laboratory as a place of creativity, innovation and experimentation, but inclusive and open to new lines of work. With the exemplary figure of Davies, the EMS could be a pioneering example of this alternative laboratory view.

Davies composed and worked on different musical projects such as Galactic Interfaces and Quintet during the EMS years. Among the collaborations, Davies was part of Gentle Fire, a six-member ensemble that performed their compositions alongside those by Stockhausen, Cage, and many more.

Davies's influence remains today and is seen as a reference for the culture of 21st-century electronic music, but he also figures as an essential exponent in creating self-built instruments.

3. Davies's self-built instruments

In 1967, the same year as the inauguration of the EMS, Davies started building his first instruments. One of the most famous is the Shozyg. Davies's self-built instruments also include springboards. All of the instruments are mostly built following the principle of sound amplification (Mooney, 2011).

Davies was a pioneer through his DIY practice in modifying "electronic sound apparatus in his early live electronic compositions (...), through the 'instrumental turn', represented by his first self-built instrument." (Mooney, 2017, p. 1). Davies, after a residency in Cologne, returned to England. In 1967, Davies started working with equipment "he could build himself" (Mooney, 2017, p. 4) and "he began to build makeshift 'instruments' comprising every-day household objects fitted with contact microphones." (ibid.). By that time, Davies also started playing live electronic music "using amplification of conventional instruments by means of contact microphones." (Mooney, 2017, p. 1).

Some examples of Davies electronic music compositions are Quintet (Alstrabal) (1967-1968), Galactic Interfaces (1967-1968), and Not to be Loaded with Fish (1968-1969).

For Quintet (Alstrabal), Davies used a mixing console to control acoustic feedback via microphones and speakers, with a sine/square-wave generator, in the style of Max Neuhaus and Stockhausen (Mooney, 2017, p. 9).

Another key example is Galactic Interfaces (1967-1968), composed of two self-built ring-modulators, two sine/square-wave generators, amplified objects with contact microphones and recorded sounds from two stereophonic magnetic tapes, prepared by Davies at the EMS (Mooney, 2017, p. 9).

In Not to be Loaded with Fish (1968-1969), Davies worked with a modified record player that controlled sound distribution through two potentiometers (volume controls) and a custom-built 2-channel pulsing unit consisting of two repurposed telephone dials. (Mooney, 2017, p. 9).

In 1968, Davies started assembling found objects (made of wood, metal, glass, plastic) and "mounted them together with a pair of contact microphones" (Mooney, 2017, p. 10) inside an Encyclopedia volume with the alphabetic range "from SHO to ZYG" (Mooney, 2017, p 10). Davies named the instruments Shozyg I and Shozyg II. These were" 'instrument[s] for live electronic performance'" (Davies, 1968, cited in Mooney, 2017, p 11). Shozyg instruments had a profound impact on the experimental and improvised music scene during the 1960s. Davies's instruments were a result of an "increasingly hectic performance schedule" (Mooney, 2017, p 12), when "the practicalities of travel and the inevitably limited setup and rehearsal time highlighted the need for equipment that was compact, portable, and self-contained – all properties that the Shozyg instruments possess." (Mooney, 2017, p 12)

In 1969, Davies continued with the instrument-building practice, naming all the instruments Shozyg "to describe 'any instrument (usually amplified) built inside an unusual container'" (Roberts, 1977 in Mooney, 2017, p 13). The majority of those instruments "were intended, not for concert performance, but for exhibition in art galleries as sound sculptures." (Mooney, 2017, p 13).

Davies also continued developing his concert instruments adding "individual found objects" (Mooney, 2017, p 13). Such objects "were coiled metal springs (...) amplified via an electromagnetic pickup" (ibid.). Davies's experiments with springs "led to the construction of five new concert instruments in 1970 that he referred to as Springboards" (Mooney, 2017, p 14). Springboards were Mk. I, Mk. II, Mk. III, Mk. IV and Mk. V and consisted of springs attached to a board and amplified by pick-ups.

During the 1970s, Davies started modifying foot-pedals, for example, "a homemade ring-modulator 'with a choice of two oscillators'" (Mooney, 2017, p 15), "a commercial 'wah-wah'" (Mooney, 2017, p 16); and "a fuzz distortion and phase-shift pedal" (Mooney, 2017, p 16).

In 1971, Davies and his ensemble, Gentle Fire, were "invited to participate in the world première of Sternklang, a new composition by Stockhausen" (Mooney, 2017, p 20). Davies "built two new 'Stringboard' instruments"

(Mooney, 2017, p 20), using "cello strings rather than springs" (Mooney, 2017, p 20), but Davies "was not convinced that the instrument was musically effective" (Mooney, 2017, p 21).

In 1972, Davies "began building a new instrument" (Mooney, 2017, p 21) described as between the Springboard and the Stringboard. The Springstring "comprised two interconnected semi-springs (...) with a single pickup for amplification." (Mooney, 2017, p 21). Mooney adds that "the instrument was intended to be played by bowing." (Mooney, 2017, p 21).

Mooney continues with Davies's story of building instruments and follows, "In 1973, Davies began a new phase of Springboard development" (Mooney, 2017, p 22) with the Springboard Mk. VI, with four springs plus one semi-spring. It was "lower in pitch (...) and larger in physical dimensions" (Mooney, 2017, p 22). The Springboard Mk. VII and Springboard Mk. VIII followed it. These new developments culminated with the Springboard Mk. X added a "second, concentric 'keyring' with smaller springs" (Mooney, 2017, p 23) and the Springboard Mk. XI.

Mooney refers to Davies as an active electronic music composer, who

> *continued to exhibit his instruments regularly, both in solo shows, and alongside the work of other instrument-builders such as David Toop, Max Eastley, and Paul Burwell, whose group exhibition 'New and Rediscovered Musical Instruments' included all of Davies's Springboards (Scottish National Gallery of Modern Art, in 1975). (Mooney, 2017, p 25).

Mooney concludes that "Davies's DIY approach to music-making" (Mooney, 2017, p 25) took a political dimension, declaring that the use of "'junk' materials was being described 'as a corrective to the wastefulness of modern society" (Mooney, 2017, p 25), encouraging awareness of planetary resources, and turning his career into an "explicit statement against consumer culture" (Mooney, 2017, p 25) and "promoting environmental sustainability." (Mooney, 2017, p 25). Mooney's phrase "The DIY approach in Davies's work was thus born out of necessity, as a way of exploring live electronic techniques with little money and no institutional support" indicates the core ethics of the do-it-yourself underground movement and shows Davies as one of the first sound artists to contribute to the movement, and a powerful referent nowadays for hackers and makers.

Resuming and highlighting his paramount practice as a composer and a pioneer in electronic music, as well as a researcher and instrument-builder, Davies's trajectory and instruments "represent several significant milestones in the history of (live) electronic music in Britain." (Mooney, 2017, p 2).

Mooney also describes Davies' early instruments in 1967-68, the same period that Galactic Interfaces was composed. This period coincides with Davies's return to England after working with Stockhausen and finding he "could not afford to buy any such equipment of his own (Davies, 1979 in Mooney, 2015b, p 3). Davies earliest self-built instruments are characterised by being very similar to Stockhausen's techniques used in Mikrophonie I am using found objects and "amplified via contact microphones" (Mooney, 2015b, p 4). Mooney recovers Davies's words, according to which "These early instruments were originally developed as ways of generating sound material for tape-music compositions (Davies 1997 in Mooney, 2015b, p 4). Davies also "began to build instruments specifically with live performance in mind." (Mooney, 2015b, p 4).

This case study on Davies shows us how his development of techno-cultural apparatus, indeed sonic apparatuses, modifies commercial technology's logic, adding radical philosophies, ecological thinking, and critical methodologies with the imposed dynamics of the technoscientific corporate model of knowledge. Davies' contribution is essential in this research as it shows how artists methodologies in the laboratory, such as learning by doing, hands-on, and handmade, appear to be a radical contestation to imposed culture. Moreover, the instruments that Davies built can support this idea of techno-cultural apparatus rooted in a media materialist theory that defies logic on systematic production using recycled materials, as hacklabs nowadays propose. Moreover, how Davies works and applies different methodologies are an example that will be later developed in the 90s hacklabs.

Next, I want to highlight Davies' methodologies and how they are used nowadays in virtual labs (mostly environments to develop live coding) and hacklabs and hackerspaces. In doing so, artists' methodologies such as DIY and handmade will explore the laboratories' creative potential.

4. DIY and handmade practice

Davies's practice at the EMS was influenced by the electronic music masters and new music composition pioneers, but Davies added to this scene the DIY approach that contributed to teaching and learning in a more hands-on experience. Learning by doing and hands-on are applied in most media labs and hacklabs since Dewey started using it in the Bauhaus and other academic laboratories in the US.

Here, I want to highlight how Davies' practice is similar to the activities developed in virtual labs and understand these as virtual environments to develop live coding. Live coding is based in open-source, and in this way, virtual labs favour the use of free/open technologies and operative systems that hacklabs promote as a radical opposition to institutionalised labs, commercial hackathons and corporate tech. Live coding is a coder practice that contributes to musical creativity through live programming. Many live coding practices are built through open and free operating systems.

I refer to the studies by J. Mooney to show these relations between live coding and Davies's DIY and handmade practice. On the one hand, Mooney highlights that Davies' practice and live coding are developed by building their instruments. In Mooney's words:

> *in Davies's practice, as in live coding, it is the performer him or herself that builds (and/or modifies) the structures through which the music is mediated. Davies built his own instruments, which were then used in performance; live coders develop the algorithmic structures by which the music is mediated in real time, as the performance proceeds. (Mooney, 2015a, p 7)*

On the other hand, Davies's practice and live coding are both based on participation and community exchange:

> *there is a clear desire to promote understanding through participation, which manifests itself in a distinct demonstrative, or perhaps even 'pedagogical' aspect, and in community or group-based activities with an emphasis on hands-on engagement (Mooney, 2015a, p 8)*

Mooney makes relations between live coding and Davies's practices that highlight aspects of Davies's performativity that are useful for defining the laboratory as a space for musical creativity through collaboration and a hands-on pedagogical approach. For example, Mooney says, "in Davies's practice (...) there is a clear desire to promote understanding through participation and learning by doing." (Mooney, 2015a, p 8). In addition to this, Mooney adds to the list of Davies's teaching features "an emphasis on hands-on engagement." (Mooney, 2015a, p 8).

These two factors, learning by doing and hands-on, are essential for Davies's contribution to the laboratories' creative potential. As hacklabs and maker labs develop their practices through collaborative processes in open-source software/hardware, Davies' practice resembles practices in hacklabs. According to Mooney, "activities like Davies's instrument building practice (...) could very well find themselves taking place side-by-side in the many so-called 'hack spaces' and 'maker' events" (Mooney, 2015a, p 8). In this context, Davies becomes a reference and pioneer for hacklabs and maker spaces that dedicate their activity to developing audio tools, researching sound, and contributing to building sonic practices through a DIY approach, using learning-by-doing techniques promoting the practice of handmade or self-built instruments. Mooney presents more references about how evident is the fact that Davies's practices resemble hacking, "In all of these self-built instruments Davies's tendency to repurpose, modify, or hack ready-made or every-day objects can clearly be seen" (Mooney, 2015b, p 5). Another aspect of Davies's practice that resembles current practices in hackerspaces and maker labs is found in Mooney's text: "Hands-on engagement is also evidenced in the many 'Hackspaces' and 'maker' events in which live coders sometimes participate (e.g., Leeds HackSpace 2015; Maker Faire UK 2015). All of these kinds of activities have strong agendas of learning and making, or, rather, learning by making." (Mooney, 2015b, p 8).

Mooney also refers to two other theoreticians interested in seeing Davies as a pioneer for DIY and handmade culture, namely Keith Potter and Nicolas Collins. Mooney explains:

> *As Keith Potter suggests: In the 21st century, it seems that Hugh Davies's innovatory, do-it-yourself, lo-fi approach – which in several respects prefigured present laptop culture is finding favour with a younger generation to whom this remarkable and iconoclastic innovator now appears as a significant father figure. (Potter, 2005 in Mooney, 2015c, p 3-4)*

One example included in the laptop culture that Potter refers to is live coding, where coders are using open source in hacklabs and virtual labs. There is a relation between DIY and open source as both are interested in opening black boxes and understanding systems, which occur in self-established and non-hegemonic laboratories such as hacklabs or hackerspaces. Live coding through open-source and programming can be seen as a DIY methodology, where coders and programmers build their software and programs. DIY software and hardware methodologies used in hacklab communities are a referent for an alternative laboratory. Continuing with Mooney's references, Nicolas Collins

> *identifies Davies as one of the earliest pioneers of the genre of 'piezo music': In the aftermath of Cage's 'Cartridge Music' many sound artists sought affordable techniques for amplifying mechanical vibration and microscopic sounds. Since the mid-1970s the proliferation of 'Piezo Disks' in beeping appliances has effectively put contact mikes within reach of anyone with a soldering iron... [T]he disks have insinuated themselves into surprisingly diverse corners of our recorded soundscape and have given rise to a genre of 'Piezo Music.' Hugh Davies (1943-2004) (UK) and Richard Lerman (USA) were two of the earliest innovators. Davies began inventing piezo-amplified instruments in the 1970s (Collins, 2009 in Mooney, 2015c, p 4)*

Nicolas Collins is one of the references in handmade electronic music, and he is a practitioner of electronic music, influencing in this way tendencies in sound art, sonic practices and music composition. Collins's views of Davies as a referent for handmade culture are used in this research to defend the laboratories' creatives potential. Davies's practice influenced the EMS as a laboratory to apply handmade electronics and DIY learning by doing.

Davies' practice is a referent to analyse the artists' methodologies in the laboratory and transform this into a place for knowledge and creativity. Davies can also be seen as a referent for hacking methodologies. For example, when Mooney refers to Davies's instrument-building practice as influenced by Mikrophonie I: "First, it involved the repurposing—which is to say, 'hacking'—of every-day objects as musical instruments." (Mooney, 2015b, p 3). Moreover, Mooney insists on Davies' practice as hacking: "live electronic music, amplification, and the hacking of every-day objects—went on to become defining characteristics of Davies's instrument-building practice" (Mooney, 2015b, p 3).

In short, the figure that Mooney, Collins and Potter describe as a pioneer of DIY, handmade electronics, and hardware hacking can be seen as a precedent for hacklabs, hackerspaces and maker labs that focus on working and researching about sound, sonic practices and music. In addition, Davies participated "within several over-lapping contexts, including avant-garde art music, jazz, improvisation, and of course the broader context of instrument-building itself "(Mooney, 2015c, p 5) working "with various other instrument-builders, notably Max Eastley, David Toop, and Hans-Karsten Raecke" (Mooney, 2015c, p 5).

The DIY ethos was a trend in underground and counter-culture movements, and in which Davies contributed with the construction of several instruments used in live performances and compositions. Mooney refers to some features that contribute to seeing Davies's DIY ethos as a referent for future live coding, "These are: economy, materiality, community, and the environment" (Mooney, 2015c, p 5). All these characteristics appear recurrent in hacklabs, makers spaces and virtual labs that practice live coding.

Principles of reduction, reuse, and recycling are like Davies's DIY ethos and practised and promoted by today's hackers, makers, and live coders who participate in the open-source movement. In Mooney's words, "Davies's instruments were economical in the sense that they were quite minimalistic, and used found, recycled, or cheaply available objects as their constituent materials." (Mooney, 2015c, p 5). Moreover, hackerspaces develop their practice based in the community and share and apply networking practices. Hackers and makers are associated through extensive connections between hackerspaces and maker labs and the practice of online networking performances, as is the case with live coders. These movements are centred on the participation, collaboration and creation of communities that develop their tools, instruments, devices, and computer software. About the community-centred practice in terms of Davies's DIY ethos, Mooney says

> *There was also an open, community-spirited ethos underlying Davies's practice. He ran instrument-building workshops with children, for instance, where the idea was that anybody could participate, regardless of background, and without the need for formal musical training. He also frequently exhibited his instruments in art galleries, where members of the public were encouraged to interact with them. For Davies, music, as an activity, was supposed to be inclusive, collaborative rather than competitive, and non-hierarchical. There is a sense that he wanted as many people as possible to become involved in music-making, and he structured his activities around this credo. (Mooney, 2015c, p 6)*

Davies's music-making through DIY ethos proposes a view of the laboratory where artists, sound artists, hackers, makers (and others) contribute to sound practice and research in an open and inclusive perspective. This coincides with the idea of the counter-laboratory in Latour and the feminist lab in Emerson. The actor-network theory about the laboratory defines the lab as a cross-relational space where different practices, from science to politics and economics, interfere. In this sense, Latour opts for perceiving the laboratory as an open space where relations between agents happen. In Emerson's perspective of the lab, inclusivity is the critical element in the reformulation of laboratory practices, as labs are places of collaborative work with different agents, not only male humans but others such as females and non-humans.

Furthermore, Emerson claims a feminist perspective of the labs, referring to women's theories and practices in lab environments. Inclusivity criteria are vital in criticising hegemonic knowledge and current laboratory practices in techno-capitalistic developments and exploitative resources management. This dimension connects with the fourth feature that Mooney highlights in Davies's DIY ethos: environmentalism. According to Mooney,

> *Davies was also an environmentalist, and this is reflected in many aspects of his creative output and professional practice. His compositional work often took its inspiration from nature and the natural world, and he held parallel interests in field recording as well as advocating the building of acoustic parks in cities. Recycling and repurposing were prominent characteristics of his instrument-building practice, and one of the stated aims of his workshops was to encourage participants 'to realise that the riches of our planet do not need to be consumed and thrown away so quickly' (Mooney, 2015c, p 6)*

Davies operated a significant influence in the UK education scene working at the EMS, where he developed learning by doing. Davies also participated with these pedagogic techniques, coping with new apparatus, instruments and synthesisers acquired by the laboratory he was working in. He approached new technical resources from an artistic perspective without having a scientific or engineering background. As Davies himself explains, "By the end of the 1960s, it had become possible to build simple circuits from magazines without any detailed knowledge of electronics" (Davies, 2001, p 53). Another creative methodology that Davies applies in the laboratory is about the self-taught experience: "We were both self-taught on the technical side, learning as we went along" (Davies, 2001, p 54). Nowadays, most media labs acquire and develop STEM (science, technology, engineering, mathematics) and STEAM (science, technology, engineering, art, mathematics) practices in a transdisciplinary approach. Again, Davies is a pioneer for media labs practices applying music and art to develop engineering and electronics and embracing creativity to operate and create new instruments in the laboratory environment. The Goldsmiths' laboratory, in which Davies experimented shows contributes to understanding the lab as a creative place for arts and music.

5. Curating

Moreover, Davies challenged the curatorial practice in developing activities such as instrument-building workshops and public exhibitions of instruments, because "throughout his career, Davies built more than 120 musical instruments and sound sculptures that 'incorporate[d] found objects and cast-off materials'" (Roberts 2001 in Mooney, 2015b, p 1). Davies is also a referent for alternative curatorial practices developed through laboratories, exploring the possibility of challenging curatorial tendencies through workshops and new exhibiting dimensions. Davies's laboratory influences curatorial practices through workshops and exhibitions not in a conventional way, but "not undertaken solipsistically, nor purely for his own artistic gratification." (Mooney, 2015b, p 6). Working with the laboratories' creative potential, workshops, and new challenging exhibition methods can be a feature for developing a reviewed concept of the scientific laboratory. Davies presented creative laboratory methodologies such as workshops and exhibitions in a challenging manner. In Mooney's words, "Davies's frequently staged instrument-building workshops for children" (Davies 2002, p 96), for example, as well as regularly exhibiting his instruments in art galleries, where members of the public would be encouraged to play them. Such activities were underpinned by a commitment to learning by doing, a methodology contributing to exploring creativity in laboratories. Davies's ethos is shown in the very first of his performance instruments, the Shozyg, which was described in the BBC's The Listener magazine as "'an encyclopedia degutted to substitute direct experience for learning'" (Davies, 1974 in Mooney, 2015b, p 6).

Davies also challenges traditional curating, a methodology that developed in laboratories offers a creative view of the laboratory, more inclusive and related to knowledge production from a different view, not science-centred, and offering a radical position in front of traditional practices based in the occidental and colonialist perspective often applied in cultural institutions.

6. Conclusions

Davies's use of creative methodologies in laboratories contributes to reify the view of the laboratory. Through different methodologies, such as learning by doing, DIY, handmade, hands-on, and self-built instruments, Davies participates in advancing hacking culture and creating media labs and hacklabs in academic environments. For example, at the Electronic Music Studio, Davies built a laboratory where practice, theory, and teaching developed through learning by doing and hands-on methodologies, which are nowadays applied in media labs, and hacklabs, and also laboratories dedicated to sound art, sonic practices and music, that contribute to redefining the laboratory in itself and its role in society.

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