

# Mario Bertoncini's Musical Design Course: Between Renaissance pedagogy and contemporary research-creation

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**This article explores the Musical Design course offered at McGill University by Mario Bertoncini in 1975–6 in a collaboration between the music department and the department of mechanical engineering. Some of the students independently created a collective named Sonde (originally named MuD from the name of the course). This unique pedagogical experience, influenced by Bertoncini's understanding of craftsmanship in Renaissance workshops, will be presented as an antecedent of research-creation or artistic practice as research, a ubiquitous and vastly recognised modality of research that has been gaining more and more traction since the early 2000s.**

## 1. INTRODUCTION

The Italian composer Mario Bertoncini (1932–2019) arrived at McGill University early in 1975. From the 1975 spring term until the 1976 fall term (Rea 2008: 96) he was in charge of a course called Musical Design. The course was offered in collaboration between the music department and the department of mechanical engineering. Some of the students independently created a collective they named MuD (from the name of the course), with their first ever public performance in March 1976. A few years after their foundation, the group renamed themselves Sonde, the name I will use throughout this article.

In this text, I will talk about this pedagogical experience as an antecedent of research-creation or practice as research in the arts (respectively RC and PaR hereafter), a ubiquitous and vastly recognised modality of research that has been gaining more and more traction since the early 2000s.<sup>1</sup> This is not the first attempt at a comparison between an experience and a conceptualisation separated by a significant time gap (roughly 25 years). Composer John Rea, who was

a faculty member at McGill in the 1970s, already hints at the fact that the structure of the Musical Design course was a prototype for RC. In an article published in the Montreal-based journal *Circuit*, within a special issue dedicated to a portrait of Mario Bertoncini, Rea rightly notes how *Circuit* has always been an outlet for RC-related works. In remembering previous instantiations of that, he goes back as far as the Musical Design course and his encounter with Bertoncini as one of the first examples of RC he encountered (Rea 2004: 87). While this is a passing comment, this article takes this intuition seriously and develops it to explore whether this comparison holds up.

The historical research on the Musical Design course is conducted using archival documents from the Sonde subcollection within the papers of Charles de Mestral, one of the participants, held in the special collections of the music library of McGill University, and from the Mario Bertoncini collection held at the archives of the Akademie der Künste in Berlin. In addition to the archival documentation, I also used accounts and interviews with the participants carried out individually in 2014 and 2022–3 and in a group setting in May 2023.

## 2. RESEARCH-CREATION AND ITS ROOTS

While it is rather easy to argue that RC is an attitude that has been present in artistic creation throughout its history, the conceptual frame that has eventually developed into RC and PaR seems to have originated in Finland and the UK in the mid-1980s. This means it emerged a few years after the Musical Design course. Since then, RC has become a significant concept in Australia, the Nordic countries, South Africa, France and Canada. This geography is mostly due to the fact that these are also the countries that currently provide funding schemes (variously structured) for such research within academia. By contrast, RC has met with resistance in some parts of (Continental) Europe; and in the US the development of RC has been much

<sup>1</sup>There is a plethora of terms to address what in Canada is commonly called research-creation (or *recherche-cr ation* in French) and in the UK and various parts of Europe is usually called practice as research (PaR) or practice research. The expression 'practice-led research' is also used, particularly in Australia (May 2015: 4). Nevertheless, for the sake of this text, these terms can be clustered together as synonyms, and I will be mostly using research-creation (RC) because the case study at hand is connected to Montreal.

stronger in the visual than in the performing arts (Nelson 2013: 11).

A key moment in the establishment of RC, or in this case more precisely PaR, was the Bologna Declaration in June 1999 (Born 2022: 319–20), through which several European countries started to implement gradual policies to make higher education more comparable across nations and to enable international mobility of students. This process was particularly thorny when it came to arts and music education, as in many national traditions, arts education had developed outside the university system. Indeed, the integration of advanced training in the arts and in music into academic higher education is a very recent phenomenon, and one pioneered by the United States. In Canada, McGill University was among the first to offer a degree in music (1904). Over the twentieth century, the number of programmes increased; for example, the Université Laval proposed one in 1922 and the Université de Montréal in 1950. Only in the 1990s did such programmes become widespread (Stévance and Lacasse 2018: 58 n1). This ‘increasing emphasis on “artistic research” in its various appearances, and on its output ... results in a need to report formally on a broader range of output, other than textual material, which leads to an array of practical questions facing research management on how to deal with the capture, evaluation and storage of artistic research output’ (Amez, van Kerckhoven and Ysebaert 2013: 118).

In the last 25 years, RC has taken many shapes and has been described in many ways. For the sake of this article, I would like to offer three definitions that are meaningful to the topic at hand. The first one, by theatre and intermedial performance scholar Robin Nelson, focuses on what RC is in universities nowadays:

PaR [or RC] involves a research project in which practice is a key method of inquiry and where, in respect of the arts, a practice (creative writing, dance, musical score/performance, theatre/performance, visual exhibition, film or other cultural practice) is submitted as substantial evidence of a research inquiry. ... In my taxonomy, PaR arises only where an insightful practice is submitted as a substantial part of the evidence of a research inquiry. (Nelson 2013: 8–9)

According to Nelson, this definition is based on the acknowledgement that there are two different types of knowledge. One is ‘propositional knowledge’ identifiable as ‘know-that’; the other is ‘procedural knowledge’ or ‘know-how’. Intellectualist theories, as they are known in the field (Fantl 2008; May 2015) see ‘know-how’ as a form of propositional knowledge (how to do something relies at least in part on implicit or explicit propositional knowledge). Weakly anti-intellectualist theories see propositional and procedural knowledge as different. Strongly anti-intellectualist theories see propositional knowledge

as a subset of procedural knowledge (meaning you need a form of know-how to know-that) (Fantl 2008: 452). Intellectualism is the traditional stance of relationship with knowledge used in Western philosophy and, therefore, in Western education and academia. According to Shaun May, a drama and theatre scholar as well as a theatre practitioner, and Nelson, RC proposes an anti-intellectualist stance, for some a mild one, for others a radical one. Hence, the RC methodology stands on several assumptions. Two of them are important: 1) actions can be intelligent without being guided by propositional knowledge (May 2015: 46–9); and 2) RC requires different ways of contribution to knowledge from those traditionally accepted in academia.

In order to describe RC as carried out by Bertoncini and Sonde, one can also resort to the distinction between practice-based and practice-led research proposed by researchers in art and technology Linda Candy and Ernest A. Edmonds: ‘If a creative artifact is the basis of the contribution to knowledge, the research is *practice-based*. If the research leads primarily to new understandings about practice, it is *practice-led*’ (Candy and Edmonds 2018: 64, italics in the original). The former is definitely the type of research carried out by Bertoncini and Sonde, in which ‘making an artifact is pivotal, and the insights from making, reflecting and evaluating may be fed back directly into the artifact itself’ (Candy and Edmonds 2018: 64). Indeed, in a grant application dated 1976 held in the Charles de Mestral collection at the McGill Music Library, the members of Sonde describe their research relation with their artifacts in a way that strongly resonates with practice-based research as described by Candy and Emerson: ‘[m]embers of the group design and construct the sound-sources necessary to realize the results of the research’.<sup>2</sup> This aspect will be discussed more extensively later when I describe examples of final projects of the Musical Design course.

Another helpful definition is by Michael MacDonald, himself a practitioner of RC:

Research-creation occurs when research is applied to creative practice, and when creative practice becomes a site of research. The process is iterative, each term working on the other, and it leaves neither research nor creative practice unimpacted. There will always be at least four types of outcomes from cinematic research-creation: (a) a film, (b) reports on process, (c) a transformed filmmaker and (d) new and sometimes short-lived social groups. (MacDonald 2023: 4)

In this definition, MacDonald focuses on the outcomes of RC, both those that are tangible (such as an

<sup>2</sup>The document is held at the McGill Music library, Charles de Mestral Collection, sub-fond Sonde, Series 2, Box 1, Folder 2.

artwork and reports) and those very hard to quantify outcomes that research and embodied knowledge have on the lives of the people involved, such as the experienced of being transformed and the creation of social groups built around the experience of doing RC. Although MacDonald practices in the fields of ethnomusicology and videomaking, this description of RC is a very productive way to frame the experience of the Musical Design course.

### 3. MARIO BERTONCINI AND THE *BOTTEGA DELL'ARTE*

The Musical Design course was proposed by Mario Bertoncini when invited to join the faculty of music at McGill University.<sup>3</sup> The invitation was extended by Alcides Lanza, then a faculty member at McGill. In 1973, Lanza was in Berlin and he met Bertoncini, who was then an 'artist in residence' supported by a DAAD scholarship. At that point, Bertoncini was 41 and had a decade of professional experience as composer. In 1962, he received a scholarship to spend time at the Studio for Electronic Music (later renamed Institute of Phonology) in Utrecht, where he attended the electronic courses by Gottfried Michael Koenig and worked under his supervision. He received the Gaudeamus International Composers Award in 1965, and in the same year he started to participate in the newly founded Gruppo di Improvvisazione Nuova Consonanza (GINC), an experience which he would continue until about the time he moved to Berlin in 1973. Especially after his experience in Utrecht, he moved away from the practices and cultures of electronic music studios and electronic sound synthesis. He felt that studio gear was too impersonal and imposed an external aesthetics on the composer's work. Nevertheless, he was impressed by the possibility of modelling the attack and sustain of sounds. Therefore, he devoted his creative research in devising preparations and objects that could help him achieve that envelope control as well as continuous spectral-rich sounds on acoustic instruments (or partially acoustic when using amplification).

In parallel with his career as a composer, he continued to work as a successful pianist and performer and in 1967 he performed *Cartridge Music* by John Cage. The experience, together with the performance of *4 Systems* by Earl Brown around the same time, would have a long-lasting impact on his creative life; amplification through piezoelectric microphones would become a signature of his work around 1973. In fact, while in Berlin he focused on building aeolian harps and gongs amplified through

contact microphones. It was after this turn towards object building that he received the invitation to join the McGill faculty.

Faculty members in Montreal, and among them Alcides Lanza in particular, were very interested in his aeolian harps and especially in his conception of the *bottega dell'arte* (art workshop), and the Musical Design opportunity was the first opportunity for him to put it into practice. While Bertoncini published a text in which he theorises the *bottega dell'arte* only in 1979 (four years after the course), archival documentation shows how this idea was the basis of his Musical Design course. In the notes Bertoncini created for the course preparation, there is a document called 'Proposed course structure' where he writes: 'Working plan for a modern "Bottega dell'Arte." [I]nterdisciplinary research accomplished by a number of "experts" in various fields (an electronic technician, a mechanic technician, a composer, a visual operator etc.) and their respective apprentices.'<sup>4</sup> John Rea, who was a faculty member and composer in the McGill music department in 1974, confirms the importance of Bertoncini's idea of a hands-on workshop at the basis of his course:

As soon as he moved to Montreal, Mario Bertoncini spoke to me ... about an idea that was very dear to him: the *botteghe d'arte*, these privileged places of artistic practice which had flourished during the Italian Renaissance. For several years, he wanted to found a new *bottega d'arte*, a new 'workshop' to encourage, promote and transform musical creation. He had also proposed a project of this kind in 1968 (he was 36 years old at the time) to the director of the Deutsch[er] Akademisch[er] Austauschdienst (DAAD, Berlin) at the time, Peter Nestler. (Rea 2004: 87–8)<sup>5</sup>

The pitch to the DAAD, however, was not successful; and the Musical Design workshop was the first opportunity for him to put his idea into practice.

The principles of the *bottega* as declared in 1979 were the following. First and foremost it should be an interdisciplinary group. It should also support a more independent relationship with current technology, on the one hand, by connecting the individual to the techniques and materials without the mediation of already-built technological tools (e.g. the synthesiser), and on the other hand, by freeing the individual from

<sup>4</sup>Document held at the AdK, Mario Bertoncini Collection, Folder 206, Document title: 'Proposed course structure'.

<sup>5</sup>Original text: 'Dès son installation à Montréal, Mario Bertoncini me parlait ... d'une idée qui lui était très chère: les *botteghe d'arte*, ces lieux privilégiés de la pratique artistique qui avaient fleuri pendant la Renaissance italienne. Depuis quelques années, il voulait fonder une nouvelle *bottega d'arte*, un nouvel "atelier" pour encourager, promouvoir et transformer la création musicale. Il avait d'ailleurs proposé un projet de ce genre en 1968 (il avait alors 36 ans) au directeur du Deutsch Akademisch Austauschdienst (DAAD, Berlin) de l'époque, Peter Nestler.' Translated by the author.

<sup>3</sup>I am exploring at length this historical background in a text on *Sonde* forthcoming in an edited collection of essays on Mario Bertoncini (see also Bertolani 2018: 71–9 and 115–24).

the career compromises needed to access technology through a research group or a studio. It should also offer a space that works as a ‘training ground for the practical exercise’ of imagination in a supportive environment of specialists. Among other things, the *bottega* should support the creation of craft-based solutions, that is, solutions that are unique and custom-made for the problem at hand.

As noted by Rea, the *bottega dell’arte* is obviously a Renaissance-inspired image of a craftworkers’ or artists’ workshop where expert artisans and artists train apprentices directly on the work rather than in a theoretical manner. This pedagogical model contrasted with that of the academies and of liberal arts training, which was focused on theoretical and philosophical subjects. While the divide between workshop and academia was not as stark as one might think, ‘[t]he sporadic instruction, lectures, and competitions organized by these academies may well have augmented a workshop education, but they by no means replaced it. Despite the best efforts of these and other Renaissance academicians of art, the artist’s training would remain firmly grounded in the workshop tradition until well into the nineteenth century’ (Reilly 2014: 99).

One could say that the Renaissance workshop is perhaps an unsurprising cultural reference for an Italian man of Bertoncini’s generation, with a background in the humanities as well as a fascination with technology.<sup>6</sup> Nevertheless, I argue that referencing it is telling of his vision and pedagogical project. Indeed, Bertoncini was part of the first generation to embody the contradictions of RC. He held piano performance and composition degrees from an Italian conservatory, and therefore his musical training had been exclusively practical. Yet, he had to work at a university, an institution that, unlike those he attended, valued propositional knowledge (know-that) over procedural knowledge (know-how). This is true even today and it is exemplified very clearly by Candy and Edmonds: PhD submissions ‘indeed *must* [emphasis in the original], be accompanied by some form of textual analysis or explanation ... to demonstrate critical reflection. A written thesis arising from a practice-based research process is expected’ (Candy and Edmonds 2018: 65). In the 1970s, the theoretical discussion on artistic practice as research was not as developed as it is today, but the academic needs of teaching in a university setting seem to resonate unchanged in the experience of the Musical Design course and today. Therefore, the Renaissance workshop offered Bertoncini a way to theorise the importance of how-to knowledge and the

rehabilitation of creative craftsmanship in the academic discourse by arguing that the Renaissance workshop was a place where theory and practice were developed together during training.

Indeed, the highly creative training and formal knowledge of the Renaissance workshops can be described as an ‘artisanal epistemology’, according to the historian of science Pamela H. Smith (2007). Smith argues that the workshop defies the Aristotelian hierarchy that places deductive thinking at the top, a hierarchy on which scientific and university reasoning was based, and at the bottom of this hierarchy one finds ‘*techne*, a how-to knowledge not generalisable in any way, partly because it deals with materials and specifics instances and circumstances that are irregular and absolutely particular, and partly because the knowledge itself cannot be written down and transferred in texts from one person to another’ (Smith 2007: 34–5).

For Smith, then, the artisanal epistemology developed in the workshop subverts the hierarchy of knowledge. In this way she shares preoccupations with Nelson, Stévanca and Lacasse, and May about the different knowledges involved in RC.

Another aspect that characterises the artisanal epistemology is that not only is craftsmanship a highly creative labour, but also the objects produced in this continuous process of creative problem solving contain knowledge. As Smith explains: ‘In the workshop, techniques were generated and knowledge emerged out of the process of making itself. In this dynamic process, knowledge was gained by doing; it was transmitted through observation and imitation of bodily gestures; it was accumulated in and demonstrated by objects, which were judged and compared by experts’ (Smith 2007: 40–1).

This emergence of knowledge from the process of making itself was identified as a central point in the Renaissance workshop by Bertoncini as well. Indeed Smith’s description finds a perfect match in the main aim of the workshop ideated by Bertoncini, that is, to ‘create ... an effective teaching tool, which summarizes in a single and simultaneous synergistic act the two phases of learning and doing, the abstract doctrine and the production of the artistic object, which, in our school systems, are radically separate and often even in opposition ... if not in open and harmful contradiction’ (Bertoncini 1979: 83).<sup>7</sup> Once again, this preoccupation with respecting the material knowledge produced, as well as the tension with the academic

<sup>6</sup>For example, quite interestingly, Luciano Berio also considered the Renaissance workshop to be a model for the ‘ideal school’ (cf. Sarno 2023: 240–6).

<sup>7</sup>Original text: ‘creare ... uno strumento didattico efficace, che riassume in un unico e simultaneo atto sinergico le due fasi dell’apprendere e del fare, la dottrina astratta e la produzione dell’oggetto artistico, le quali, nei nostri sistemi scolastici, sono radicalmente separate e spesso addirittura in opposizione ... se non in aperta e deleteria contraddizione’. Translated by the author.

practices that tend to minimise material knowledge, are very present in the contemporary RC discourse. One example is that of Paul Couillard, who voices very similar preoccupations: 'It is one thing to understand research-creation as a knowledge practice, another to create an entity through research-creation that presents itself as a manifestation of knowledge in its own right, in its own medium, and yet another to sort through how to translate that knowledge to text, which remains the lingua franca of the academy' (Couillard 2019: 70).

Obviously, there are also stark differences between Bertoncini's workshop and the Renaissance workshop. What is different in Bertoncini's workshop is that students are not co-opted for the realisations of the master's view, nor do they have to master his style first. Nevertheless, it is possible to see some experimenting in imitation and variation by students in the objects created. For example, Sonde's Hum Drum was made of two parts: a metal barrel without bases, to one end of which was attached what clearly resembles a square aeolian harp by Bertoncini.

#### 4. THE WORKSHOP OF THE MUSICAL DESIGN COURSE

At McGill, with the Musical Design course, Bertoncini's vision of a *bottega dell'arte* was put into practice (at least partially) for the very first time.

According to the proposed course structure, Musical Design had three learning outcomes:

- a) to give the student the opportunity of experimenting simultaneously the preparatory (purely didactic) and the practical stages of his own discipline, i.e. to research as well as to participate in the creation of the final artistic product.
- b) to stimulate an 'active' curiosity toward the basic functions of sound-producing media (acoustic as well as electronic or mixed); to create alternative relationships between composer and his sonorous medium (e.g. by providing him with the possibility of modifying and/or designing *ex novo* such media as contrasted with accepting the product which current technology offers him).
- c) to establish a favourable environment for the study and analysis of interdisciplinary problems.<sup>8</sup>

These learning objectives are mobilising all the principles expressed in the 1979 text on the *bottega dell'arte*. In particular, the learning outcomes show an interest in developing how-to skills that are relevant to the field and practice of the student and a distinct emphasis on interdisciplinarity. To this extent it is

<sup>8</sup>Document held at the AdK, Mario Bertoncini Collection, folder 206, document title: 'Proposed course structure'.

important to remember that the course was done in collaboration with the department of mechanical engineering at McGill.<sup>9</sup>

In the document, Bertoncini also stresses that research is as important as direct participation in musical activities. The idea that music, and in particular electronic music, needs research (a term with a strong academic connotation) was not unique to Bertoncini in the 1970s. One could think, for example, of the Groupe de recherches musicales in France, which had had research in its name since 1958. The composer Franco Evangelisti, closely connected to Bertoncini as they were both members of the GINC and the Associazione Nuova Consonanza, had been writing extensively on the need for research in music since the 1960s (Farina, Bertolani and Pellegrini forthcoming). Rea discusses the connection between Bertoncini's idea of *bottega dell'arte* and the Institut de recherche et coordination acoustique/musique (IRCAM). While I would not dwell on the similarities between the two projects because the underlying aesthetics and available resources of the two are too different, one must admit that the synchronicity is striking: while IRCAM opened in 1977, Pierre Boulez announced the project in March 1974 (even though it had been in the works since 1970) (Féron and Zattra 2023). The creation of research centres for electronic music that stressed their research vocation from the get-go continued. For example, IRCAM directly inspired another research centre in Italy founded by Luciano Berio, that is, Tempo Reale (Sarno 2023). And the list could go on. Thus, in the 1970s, research (both in the academic and in the creative sense) and music were two concepts that went hand in hand.<sup>10</sup>

The proposed course structure also shows that the course used three different pedagogical strategies: theory, laboratory and performance practice.<sup>11</sup> The theoretical part covered elements of acoustics, organology and analysis. The document shows that with regard to acoustics, Bertoncini was complementing the topics already discussed in other courses offered in the music programme; for example, course 198-224 B 'Physics of Music'. As for organology, besides constructive

<sup>9</sup>The department of mechanical engineering was very close to the actual space of the workshop, as communicated to me by Charles de Mestral in an informal conversation during a stroll together on the McGill campus in spring 2023.

<sup>10</sup>Obviously 'research' is a loaded term that can have many different meanings and applications, and this is true also within the conceptualisation of RC and PaR (Candy and Edmonds 2018: 63-4). Every one of the historical experiences quoted here mobilises the term 'research' from a different perspective and with different goals. Nevertheless, I think it is important to notice how ubiquitous the term was.

<sup>11</sup>The document uses the expression 'performing practice'. It is important to remember that the planning of the Musical Design course was, as far as I know, the first occasion of Bertoncini planning a document and a course in English.

principles of instruments, he really focused on electronic organology including the following topics: ‘Some electronic systems[;] Analogies, in electronic terms, to acoustical systems[;] Analysis of the standard processes of sound production and modification.’ The topics listed under analysis are the most varied, such as linguistic theories and information theory, but also historical topics, such as constructivism in Italy and Russia and the Bauhaus experience. The choice of the Bauhaus as a topic reinforces the emphasis on craftsmanship (Dearstyne 1986: 197) and the relation to the workshop. For example, in order to join the Bauhaus one had to take a preliminary course for half a year, which consisted of ‘[e]lementary instruction in form together with exercises in materials, in the special workshop for the preliminary course. Result: admission as apprentice to a workshop’ (Dearstyne 1986: 85). The fact that Bertoncini chooses to cover the Bauhaus, a radically innovative pedagogical space that proposed specialised workshops even before official admission as an apprentice, suggests that he envisioned RC as an approach that is not confined to postgraduate research programmes. Indeed, both Bertoncini and the Bauhaus adopted such an approach from the earliest stage of training, contrary to the university model, which tends to see tertiary education and research as two successive stages of training.

The laboratory part addressed the same principles from an applied point of view. On the one hand, Bertoncini was asking the students to realise and construct sound generators that could be acoustic, electronic or mixed as an assignment. To do so they had to experiment and apply what they had learned in the theoretical part and explore construction and sounds with ‘series of units of different dimensions and metals, each series consisting of: a) bars b) rods (electr. ampl.) c) plates (acoustical/electronically amplified) d) membranes (adjustable tension, electronically amplified) e) glass hemispheres operated by small DC motors with variable speed’.<sup>12</sup> As small amplified sounds had a huge impact on Bertoncini’s practice, as mentioned earlier, he also encouraged the students to ‘research on the amplification of sounds not otherwise audible’. As pointed out in the abovementioned 1976 grant application: ‘The use of synthetic electronic sound-sources is generally excluded. However, electronic processing (amplification, filtering, ring modulation,

etc.) will be used to fully exploit the sound-sources.’<sup>13</sup> The importance of amplification of small sounds and the use of contact microphones and their transformative and revealing power are also poetically highlighted in a few lines of a long mesostic that Andrew Culver, a student in the course, dedicated to Bertoncini:

contact Microphones  
A sound  
souRce  
not an exIsting instrument  
invented newly with Only a future (Culver 2004: 96)

Bertoncini also encouraged students to explore ‘functional interaction between one of the above-mentioned instrumental entities and the visual parameter: modulation of lights, use of photo-resistors, sensitive to different colors, to operate the DC motors etc’.

This laboratory-based exploration should help students create their own proposal for an individual project as well as foster the creation and participation in collective projects with one or several of the sound-generating objects created during the course.

Finally, there was also a performance practice part, which included improvisational practice. However, these three areas should not be understood as distinct, nor should the laboratory part be seen as simply an application of theoretical knowledge. These three different ways of studying and understanding are integrated with each other.

During the Musical Design course, a group of students formed a musical ensemble. Among them were Andrew Culver, Pierre Dostie, Chris Howard and Charles de Mestral. From the beginning (*c.*1976) the group also welcomed members who were not originally students in the course, such as Linda Pavelka, Robin Minard and Keith Daniel. Even though not part of the Musical Design course, all these members learned and implemented the principles that Culver, Dostie, Howard and de Mestral had learned and then communicated and shared with new members. The Sonde group had an outstandingly long career, performing in Canada and abroad well into the 1990s, always applying and building on what they learned in the course. Over the years they continued to build new sound sources of different types, such as acoustic ones, amplified ones and also electronic devices (e.g., preamp mixers, brainwaves pickup modules, mixers) built from scratch (some photos can be found in Sonde 2009) following the principles of craftsmanship and independence learned during Bertoncini’s workshop (Keith Daniel was the member that focused on this the most, even though he was not the only one).

<sup>12</sup>Archive of the Akademie der Künste, Mario Bertoncini Collection, Folder 206. Incipit of document: ‘Title: Musical Design/Structure’. DC motors were created by Bertoncini before going to McGill. They are small motors to which a wheel cover in rubber is attached. As the wheel spins, the performers put the motors on resonant points of the piano strings to play the harmonics (for further details on this specific object, see Santacesaria and Bertolani 2023).

<sup>13</sup>McGill Music library, Charles de Mestral Collection, sub-fond Sonde, Series 2, Box 1, Folder 2.

Charles de Mestral, the member of the group that since the beginning kept the most material, donated his documents to the music library at McGill University, where there is now a Charles de Mestral fonds with a Sonde sub-fonds. At the moment the collection is comprised exclusively of paper and audio-based documentation of contextual, oral and practice-based knowledge.

#### 4.1. The *bottega* apprentices now

Within the context of my research project ARPOEXMUS, funded through a Marie Skłodowska-Curie postdoctoral fellowship, in May 2023 I facilitated a video-recorded group interview (which I will use in the following section) with four Sonde members: Charles de Mestral, Andrew Culver, Pierre Dostie and Keith Daniel. The first three were also students enrolled in the Musical Design course. Before the interview, the four participants received a booklet containing a selection of documents from the Charles de Mestral collection related to various phases of their long activity together and not restricted to their participation in the Musical Design course. Nevertheless, the booklet also included my transcription of Bertoncini's course plan held at AdK. These documents were supposed to function as triggers of memories of their activities and the interview's goal was to add depth to the paper-based documentation held in Montreal.<sup>14</sup>

When presented with the Bertoncini's notes, the four participants were very surprised and moved because they could recognise the topics and the ethos that they had got to know during the course. While they recognised that the contents of the document sounded familiar and made sense to them, they also noticed that, even for what concerned the theoretical part, there were never traditional lectures where students would sit down and take notes while Bertoncini spoke (video 1, 14:45–15:15). Rather, the theoretical aspects were delivered informally and organically in a workshop environment when the information was needed and delivered in a 'passionate' and 'opinionated' way. All students remembered his behaviour during the performance practice portion of the course. While exploring the materials at hand, it was important that the students refrain from imitating from others or from the past in their choice of musical gestures or elements. Culver, for example, noted that, from a pedagogical perspective, this was not easy to do without giving too many negatively phrased rules in advance or without creating excessive bias beforehand. However, he noted that one can always flag those derivative gestures

while someone is doing them. Therefore, it often happened that while they were improvising together Bertoncini would stop them to point out imitative or derivative gestures. This was done strictly so that sometimes improvisation sessions would last just a few moments before being stopped (video 1, 16:10–18:16; this is also in line with Culver's account in Culver 2004: 97–8). Thus, Bertoncini himself was bringing to the classroom something he experienced himself while improvising in the GINC beforehand (Bertolani 2019: 3.1–3.3) and something that he kept doing afterwards when working with performers for his own pieces (Santacesaria 2022; Santacesaria and Bertolani 2023).

#### 5. FINAL PROJECTS: AN EXAMPLE

To understand how these three pedagogical modalities intertwine in practice, I present the example of what appears to be de Mestral's final project proposal for the course, namely 'Les Plaques' (also called 'Steel Sheets' in English). These were a constructed sound source for the Musical Design course and then remained in use by the group in the following decades. The Sonde collection contains a document that appears to be a final paper in which Charles de Mestral illustrates his final project, *L'Acier Intempérant* (or *Steel Sheet Project* in English). The document consists of four typed pages in which de Mestral explains objectives, construction details, ways of sound activation of this sound source, as well as the difficulties overcome in the construction. One of these was overcome with the help from J. M. Forde, a professor in the engineering department, to understand the modes of vibration of the membranes, probing that the collaboration of the Musical Design course with the Faculty of mechanical engineering was unofficial (Rea 2004: 88), yet it was real in the daily life of the students attending. In the end, de Mestral states that he opted to work with an experimental procedure using the Chladni vibration method to better understand the vibrational modes of his steel sheets. This final paper is preserved together with photocopies of books on acoustic physics dealing with membrane vibration and the Chladni method with images of tables of Chladni vibration modes, as well as four photocopied pages of an originally handwritten document signed by J. M. Forde, with mathematical formulas that explain the vibration in flexible and homogeneous membranes of a rectangular shape fixed at the edges.

The report also contains a list of possible ways of exciting the steel sheets, describing in detail how the action was done, the materials used and the differences in sounds if using different materials (e.g., hitting, scratching, attaching nylon wire or horse-hair covered in rosin, bowing). While some of these techniques echo the research done by Mario Bertoncini (who had been using nylon wire and

<sup>14</sup>The video interview is now held the music library at McGill University as an addition to the collection of Charles de Mestral and will be made available to interested users according to the rules of that institution and according to permissions granted by the participants.

horsehair and bows on cymbals since the early 1960s), this report is clearly a summary of hours of hands-on explorations on the sound source created. This is also supported by the fact that most of these details – for example, the size and thickness of the sheets, the various ways of putting them into place to optimise vibrations, the ways of hitting them – are also found in forms of handwritten notes collected probably as observations during the explorations of the sound source over the course of several weeks. In the handwritten notes, there are in fact ways of exciting the sheets that are not present in the document because they were probably discarded (e.g., using water for splashing, bubbling and even some actions done underwater).

In the final part of the report, de Mestral notes that ‘the possibilities of the sheets were explored through group improvisation’ and that his steel sheets had been used in collective improvisations with Culver, Dostie and Pierre Faulkner. In this sense, even the collective improvisation sessions featured in the performance practice portion of the course were part of a research activity. Indeed, these sessions were conducted not as a means in itself (to be able to improvise), but rather as a performance technique that promoted exploration of the object (Fillion 2013: 11).

Similar to the materials associated with the Steel Sheet project, the collection holds many drawings highlighting the preliminary work on the design of the Sahabi, another sound source of which de Mestral would create two exemplars (one during the Musical Design course and one in 1978) and which would be used for a very long time by the group (Fillion 2013). It is possible that the other members of the group privately hold more documents that can testify this work of RC that they did while attending the course and then in the following years.

## 6. EXERCISING RESEARCH-CREATION

The research was not confined to the design moment but spilled over into the performance practice. Bertoncini’s students experienced the importance of exercises to develop certain skills, but more importantly to free oneself from ingrained behavioural patterns. As already mentioned, this was something that Bertoncini explored himself in the GINC (Bertolani 2019). As an example, after Bertoncini left, the members of Sonde developed a practice they called ‘mudiatures’, a portmanteau of ‘MuD’ (which at that point was still the name of the group) and ‘miniatures’. As explained by Culver, ‘the game was to end the piece as soon as you started’. He continues: ‘they [these specific explorations on their sound sources] were very short in time but when you improvise them you think of every

sound that you make as the last sound ... but then somebody else would do something and you would do something. So they will not last one second but they might last twenty seconds’ (23:05–22:52; some of these mudiatures are recorded and available, cf. Sonde 2009). When asked whether these were exercises or pieces, given that they were both played during private sessions and publicly performed and even published, the answers of Sonde members were not straightforward. However, it is clear that mudiatures had a double purpose. On the one hand, Sonde members clearly enjoyed playing them and were happy with the results, hence the publication. In this sense, they had aesthetic value in themselves. On the other hand, they were also devised to solve a problem they were experiencing as a group, that is, the realisation as a group that sometimes they would have been happier with the result of an improvisation session had they ended it slightly earlier, even by just a few seconds. In this sense, mudiatures are a tool for group members to train themselves and research more satisfying ways of playing together. In this respect, then, they are exercises, and they can be seen as a way of exploring solutions, once again in line with the RC process.

## 7. CONCLUSIONS: THE GROUP SONDE AND THE CONSEQUENCES OF THE MUSICAL DESIGN PEDAGOGY

So far, the focus was on how tangible outputs (e.g., objects, reports) and tangible course elements (e.g., what was thought, the pedagogical ideology) supported the paradigm of RC. But, as the earlier quote by MacDonald reminds us, there are also outputs of RC that are intangible and yet very important, that is, a changed artist and new socialities. I think that the experience of Sonde fits the bill of RC even in this case. Both in the video interviews and in informal conversations, all the members continued to repeat how influential the experience of the Musical Design course was for them as performers and as human beings. They described the experience as radical and transformative. They also went on to create their group and they were able to communicate their *modus operandi* to new members and other artists who never attended Bertoncini’s course. The social formation of Sonde was a long-lived one, and even in May 2023 when I interviewed them as a group, I could see that they were still attuned to each other, and they happily noticed it too. This obviously resonates with the many (larger) tight-knit communities that continue to form in those fields in which RC is widely used, such as improvisation and instrument design (e.g., those organised around the annual conference of New Interfaces for Musical Expression, around the



International Institute for Critical Studies in Improvisation, and the live coding community). As I have shown, Bertoncini's course modelled on his idea of the *bottega dell'arte* predates some elements of RC approach, such as its structure combining theory (a form of know-that knowledge) and laboratory (a form of know-how knowledge).

However, it is important to notice how the proto-RC discourse developed by both Bertoncini and Sonde was not embedded in postgraduate research per se nor a methodology to be used when called for: as Sonde shows, it was a more totalising experience. The *bottega dell'arte* was a pedagogical vision that could be available to anyone from the early stages of their education, and not exclusively to already highly trained individuals. It was also a way of thinking so embedded in one's practice that it would be impossible to abandon. Indeed, both Bertoncini and Sonde continued to work according to the principles of the *bottega dell'arte* throughout their lives, always finding a fresh starting point to return to. As said by Smith, one of the major difficulties that craft knowledge from the past poses is that it is often tacit: the historical sources are silent about it, because it was transmitted through person-to-person direct exchange, without leaving behind many traces (Smith 2007: 36). For this reason, it seems hard to theorise or to communicate. For the experience of the Musical Design course as well, there are not many traces that testify to its teaching approach. However, this experience is still in our living memory. Bertoncini died only a few years ago and had the chance to talk about this experience with many people (including the author), and many of the students who attended the course can be directly involved in research because they are still active. Thus, it is important to offer a contextual meaning that can relate the pedagogical practice to the historical documents preserved about this experience. In fact, this can help us understand that RC, know-how and practical knowledges and hands-on activities have always been the natural complement to the theoretical knowledge that electroacoustic and experimental musics techniques required. In this sense, it can help us move towards a present where a more diversified set of knowledges are taught in universities with a newfound confidence.

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