

Double bass remote teaching: pedagogical strategies in an encyclopedic course at Espiral-SINOS (National System of Social Orchestras) Project in Brazil

Fausto Borém

UFMG

faustoborem@gmail.com

Abstract: With the advent of the COVID-19 pandemic, the presential classes of the *Espiral-SINOS* (National System of Social Orchestras) *Project* were interrupted for an indefinite period. The creation of instructional videos and online collective video classes was not only a way out to avoid further damage music education of hundreds of young students at a beginner and intermediate levels, but also a new and welcome technological reality that should continue after the pandemic. We present here the contents and strategies of the *Espiral-SINOS* Double Bass Course, which includes 21 instructional videos in Phase 1, and in Phase 2 the 30 directed-study instructional videos and a 60-Q&A Quiz, a project which puts performance pedagogy at interfaces with the areas of composition, music history, music theory and music analysis.

Keywords: music e-Teaching and e-Learning during the pandemic, instructional music videos, music performance pedagogy, double bass teaching, Espiral-SINOS Project in Brazil.

Ensino do contrabaixo à distância: estratégias pedagógicas em um curso enciclopédico no Projeto Espiral-SINOS (Sistema Nacional de Orquestras Sociais)

Resumo: Com o advento da pandemia da COVID-19, ocorreu a interrupção das aulas presenciais do Projeto Espiral-SINOS (Sistema Nacional de Orquestras Sociais) por tempo indeterminado. A criação de videoaulas e aulas coletivas online foi não apenas uma saída para evitar maiores prejuízos na educação musical de centenas de alunos nos níveis iniciante e intermediário, como também uma nova e bem-vinda realidade tecnológica que deverá continuar após a pandemia. Apresenta-se aqui os conteúdos e estratégias do Curso de Contrabaixo do Projeto Espiral-SINOS, o qual inclui 21 videoaulas na Fase 1 e, na Fase 2, 30 videoaulas com Estudos Dirigidos e um quiz com 60 questões de múltipla escolha, um projeto que coloca a pedagogia da performance em interfaces com os campos da Composição, Teoria Musical, História da Música e Análise Musical.

Palavras-chave: ensino de música à distância na pandemia, videoaulas de música, pedagogia da performance musical, ensino de contrabaixo, Projeto Espiral-SINOS.

Context

Mseleku (2020, p.588-589, 594) conducted a very thorough review (910 articles) of the most relevant scientific databases (Google Scholar, Web of Science, JSTOR, Scopus, SAGE Journals, Project MUSE and others) to assess the challenges of e-Teaching and e-Learning faced by academics and students around the globe during the pandemic. In spite of the various obstacles and damages due to Covid -19 (“...such as the inability to access or use the online learning and teaching tools; difficulties to adjust particularly for students living in rural areas and those from low-income families; and associated stress, depression and anxiety...”) his study confirmed what teachers and students begin to feel after two years of a most restrictive period for education: “... Covid-19 induced opportunities such as innovation and capacity development.”

On the one hand, 673,758 deaths in Brazil as of July 11, 2022 (Ministry of Health, 2022); on the other, the isolation and interruption of practically all face-to-face musical activity. Despite the enormous tragedy of the Covid-19 Pandemic, the maxim “in the crisis, create” emerged again thanks to the popularization of technological advances in the music teaching scene. Cell phones have become essential equipment for bringing together teachers and students trapped in their homes and prevented from attending traditional teaching spaces. With these gadgets and a few low-cost accessories (a tripod, a ring light, and a wall as a background) teachers were able to record instructional videos and students were able to record their practice and performance in its learning process even put together complete recitals. With cheap mobile internet or public Wi-Fi plans, we were able to hold classes at home, sending videos, receiving quick and detailed feedback, and discussing technical and musical issues at a distance.

Implemented during the pandemic, in August 2020, the Espiral-SINOS (National System of Social Orchestras, in Brazil) Project is the result of a partnership between Funarte and UFRJ (Universidade Federal do Rio de Janeiro, Brazil), which offers free of charge:

“... courses, workshops, concerts, and festivals... The objective is to train conductors, instrumentalists, composers, and music educators, supporting social music projects and also contributing to the development of school orchestras throughout Brazil.” (Projeto Espiral-SINOS , 2022)

Its eight lines of action include musical groups and courses encompassing: (1) the Strings Pedagogy Course (2) the Symphonic Orchestra, (3) the Conducting School, (4) the Opera School, (5) the Repertory Library, (6) the International Music Festival, (7) the SINOS e-Orchestra and (8) the Projeto Espiral-SINOS (2022; <https://sinos.art.br/>). The objective of Projeto Espiral-SINOS is focused on orchestral instrumental training of young musicians at beginner and intermediate levels.

The nature of this present study is creative (composing and performing) and pedagogical (teaching how to play). It began with the need to teach the acoustic double bass to children, a trend that is now consolidated with (1) the publication of methods suited to the motivations of children aged 3 to early adolescence considering their limitations of attention and study discipline, and (2) the development of *luterie* in the manufacture of instruments and equipment in reduced sizes (3/8 and 1/2, as opposed to the traditional sizes of 4/4 and 3/4) suitable for the size of the body of children, especially their upper limbs (arm, forearm, hands and fingers). The results of this applied research are threefold and of encyclopedic scope: (1) the creation of 21 instructional videos for remote e-teaching/e-learning (Borém, 2021); (2) the creation of 30 instructional videos for remote directed studies (Borém, 2022d); and (3) the composing of 20 open-string double bass etudes (Borém, 2022b), 12 major-minor scale and arpeggio etudes (Borém, 2022a), and 20 etudes for “on-the-string” and “off-the-string etudes on the double bass (Borém, 2022c).

To illustrate the pedagogical and performance aspects of the method for double bass open-strings and two double bass duets, I resorted to the tools *MaPA* (Map of Audiovisual Performance) and *EdiP* (Edition of Performance) from the *mAAVm* (Method for the Analysis of Audio and Videos of Music) that I have proposed by (Borém and Nogueira, 2020; Borém, 2016a; Borém, 2016b).

The 21 instructional videos of the Espiral-SINOS Double Bass Course - Phase 1

The Projeto Espiral-SINOS was conceived in two phases. The content of the 21 instructional videos of Phase 1 (which are also available in PDF format for download) was divided between two double bass teachers, Fausto Borém and Eder Kinappe, as a way to provide students from social orchestras in Brazil with the healthy habit of having more than one source of knowledge and performing experiences.

In “Instructional Video 01 - Posture on the double bass”, the students learn how to play the instrument standing or sitting. In “Instructional Video 02 - Double bass sound production”, the parts of the two double bass types of bow are presented. “Instructional Video 03 - Double bass bow fundamentals” shows the contact point of the bow on the strings and correspondent pressure (*forte* and *piano*) and speed (slow and fast), including a bow exercise adapted from an etude from the violin method by Leopold Mozart.

“Instructional Video 04 - Double bass sounds with the bow - Part 1” shows the minimal differences between the German and French bows (Ex.1a), and the movements with fingers, wrist, arm and forearm (Ex.1b) in both bows. “Instructional Video 05 - Double bass sounds with the bow - Part 2” covers the relation between speed and adherence of the bow hair, the frog, middle and tip regions of the bow, the contact points from the fingerboard to the bridge, angles of the bow hair, sound envelopes of the bow, and the *col legno* bowing. “Instructional Video 06 - Double bass sounds with the *pizzicato*” presents the differences between the sound envelopes of the arco and *pizzicato* timbers and the various kinds of *pizzicato* in popular music.

Example 1

Demonstrating (1a) the German and French double bass bows and (1b) forearm bow movement in Instructional Video 4.



“Instructional Video 07 - Double bass left-hand techniques” covers the expressive effects of the vibrato and portamento, and the traditional fingers of Franz Simandl (1-2-4) and Isaia Billé (1-3-4). “Instructional Video 08 - Double bass harmonics” shows the possibilities of using the partials from the harmonic series in the natural harmonics of the double bass. “Instructional Video 09 - Double bass right-hand techniques” presents the techniques string crossing and spiccato.

“Instructional Video 10 - Double bass intonation - Part 1” shows the movements of left arm, forearm, wrist, hand and fingers, to correctly control the non-tempered intonation on the double bass of different sizes (Ex.2a) by means of tactile and visual clues, the importance of ear training and the intonation problems with both traditional schools of double bass fingering (1-2-4 and 1-3-4), the longitudinal and transversal approaches to practice scales and arpeggios with and without shifting. “Instructional

Video 11 - Double bass intonation – Part 2” introduces the modern schools of fingering (0, 1, 2, 3 and 4), the subtle intonation difference in enharmonic notes (such as the G# versus A flat difference, Ex.2b), use of adjacent fingers in non-tempered double bass intonation, major and minor scales with extensions, *capo tasto* in the high and low registers of the double bass. “Instructional Video 12 - Double bass intonation – Part 3” gives instructions and excerpts of the orchestral repertory to tactile and visual intonation clues in all registers of the double bass: sub low range (double bass extension pulley and extension keys), low range (double bass nut, Ex.2c), medium range (saddle of neck), high range (triangle among upper right bout, fingerboard and capo tasto hand position), super high range (end of fingerboard), high natural harmonics range (after the fingerboard), and artificial harmonics range (capo tasto area).

Example 2

Demonstrating how to play in tune in (2a) double basses of different size, (2b) non-tempered semitones (G# and Ab) and (2c) using tactile information in the double bass nut in Instructional Videos 10, 11 and 12.



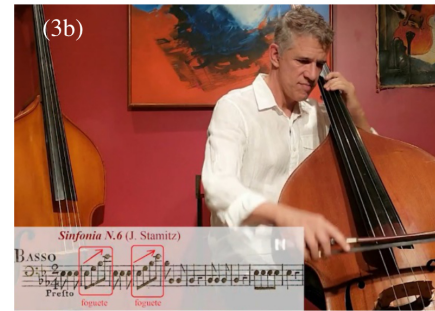
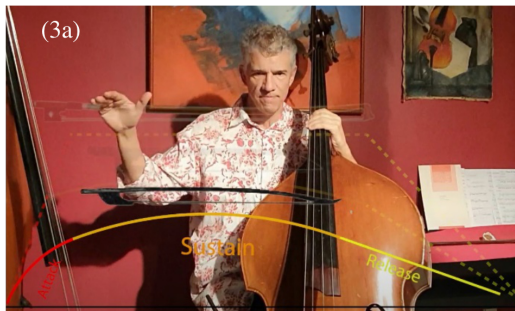
“Instructional Video 13 - Double bass literature - Part 1” covers bow regions, left hand positions, covers the in the double bass methods by Billé, Petracchi and Storch-Hrabe. “Instructional Video 14 - Double bass literature - Part 2” demonstrate how to play excerpts from the Scherzo from *Symphony N.5* by L. van Beethoven and the double bass solo in Villa-Lobos’s *Bachianas Brasileiras N.9*.

“Instructional Video 15 - Double bass in the Baroque” discusses the differences among the sound envelopes of the of Baroque (such as in the *enflé*, Ex.3a), Classicism and Romanticism/Modern neighboring styles, relevant double bass excerpts as far as performance practices of the Baroque in France, Italy and in eclectic style of Bach, the double bass and the practice of figured bass in Vivaldi’s “Winter” and ‘Autumn”, the ornaments in Handel’s music, the Baroque recitative and the motives in J. S. Bach’s “Badinerie” from the orchestral “Suite N.2”. “Instructional Video 16 - Double bass in the Classicism” discusses relevant double bass excerpts of this period, including performance practices such as the “sigh”, the “rocket” (Ex.3b) and the “*crescendo*” of Mannheim, the rococo ornaments, and the violone in works by Haydn and Mozart, and the classicism of L. van Beethoven.

“Instructional Video 17 - Double bass in the Romanticism” discusses relevant double bass excerpts from the “Pastoral Symphony” and “Symphony N.9” by L. van Beethoven’s, F. Schubert’s “Unfinished Symphony” (Ex.4a), S. Neukomm “Symphony for Grande Orchestra” (Ex.4b), H. Berlioz’s “Symphonie Fantastique”, Dvorak’s “New World Symphony”, G. Mahler’s “Symphony N.5” and P. Tchaikovsky’s “Symphony N.4”.

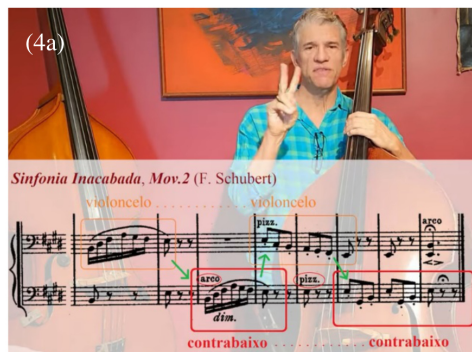
Example 3

Demonstrating historical performance practices on the double bass: (3a) the sound envelope of a Baroque *enflé* and (3b) the “rocket” arpeggio in the Classicism in Instructional Videos 15 and 16.



Example 4

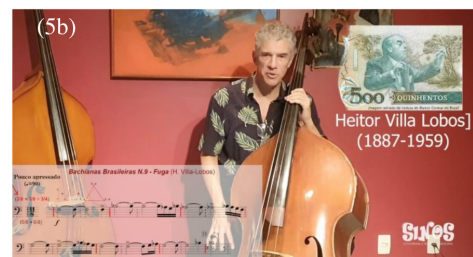
Demonstrating (4a) the independence of double bass and cello in orchestral parts and (4b) the double bass part in the first symphony composed in Brazil in Instructional Video 17.



“Instructional Video 18 - Double bass in the 20th and 21st centuries – Part 1 discusses relevant double bass excerpts of non-tonal dissonant music in Igor Stravinsky’s *The Soldier’s Tale*”, and 12-tone music in Alban Berg’s “*Concerto for Violin and Orchestra*” (Ex.5a), the E flat minor tonality and complex metrics in the double bass soli in Heitor Villa-Lobos’s “*Bachianas Brasileiras N.9*” (Ex.5b), the problems in the notation of natural harmonics in 20th-century music of A. Schoenberg, I. Stravinsky, B. Bartók and H. Villa-Lobos.

Example 5

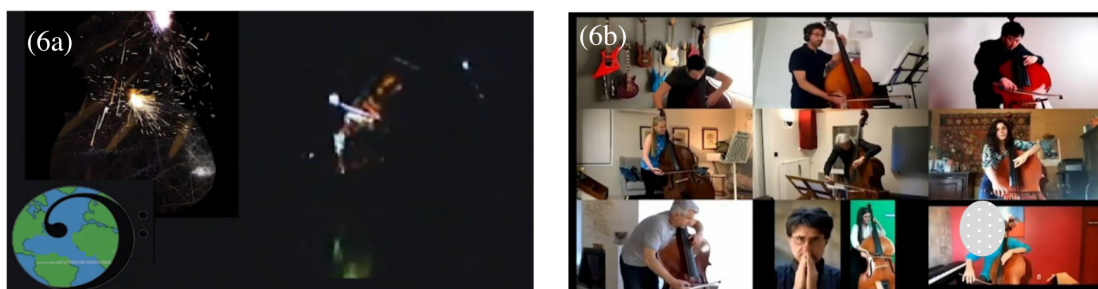
Demonstrating (5a) atonal music in by Alban Berg’s “*Violin Concerto*” and (5.b) and the E \flat minor tonality and complex metrics in H. Villa-Lobos’s “*Bachianas Brasileiras N.9*” for the double bass in the 20th-century double bass repertoire in Instructional Video 18.



“Instructional Video 19 – Double bass in the 20th and 21st centuries – Part 2” discusses relevant double bass excerpts of in Villa-Lobos’s “Choros N.10,” the alternation between *arco* and *pizzicato* in Igor Stravinsky’s “The Soldier’s Tale”, the use of *pizzicato* in Darius Milhaud’s “Saudades do Brasil” and several trends in the double bass 21st- century repertory, such as double bass orchestra and ensembles, crossover music, live electronics, theatrical music and home-office collective recitals due to the pandemic (Ex.6).

Example 6

Demonstrating (6a) live electronics music and (6b) home-office collective recitals due to the pandemic for the double bass in Instructional Video 19.



“Instructional Video 20 – Double bass routine and study planning” focuses on creating a routine of practicing the double bass using the cell phone as a tuner and a metronome, applying them in scales, left-hand shifting, and independence of left-hand fingers. “Instructional Video 21 – Scales, arpeggios and sight reading on the double bass” covers playing long-note scales with no *vibrato*, scales with 8-note patterns in *legato* and *staccato*, longitudinal and transversal scales, melodic minor scales, three-octave E- minor *arpeggios*, minor and major scales in various keys, sightreading elements (work, composer, tempo, tonality, accidentals and rhythm).

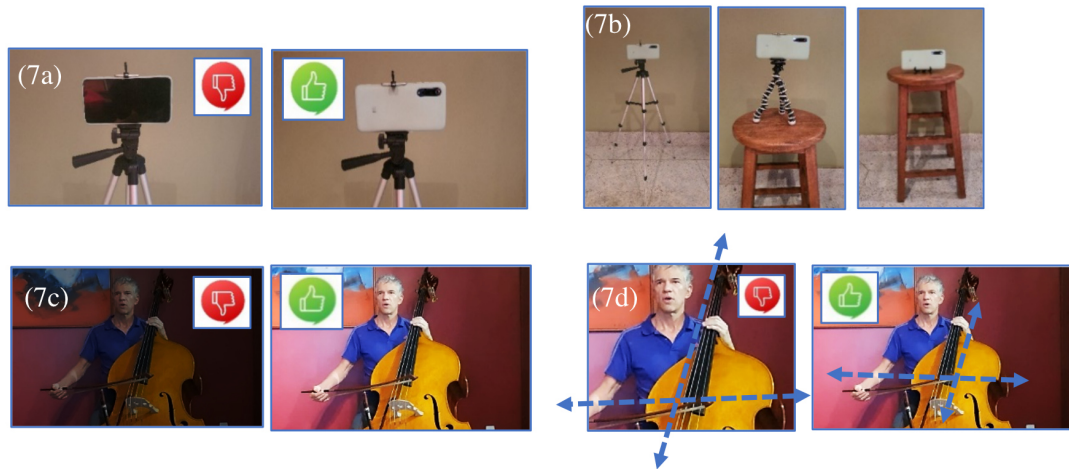
The 30 directed-study videos of the Espiral-SINOS Double Bass Course – Phase 2

For Phase 2 of the Espiral-SINOS Project, the author of this article was invited to elaborate 30 directed studies and five Q&A quizzes that would allow students to (1) delve deeper into the contents of Phase 1, (2) do homework tasks recorded in self-tapes and (3) be evaluated in the directed studies and Q&A quizzes (see section before the Conclusion) by their double bass teachers with feedback given in group classes through video conference. The “30 Directed Double Bass Studies” (which are also available in PDF format for download) are preceded by a section that summarizes the contents of these studies and contains instructions for the students to learn to record self-tapes (Ex.7) of their performances with cell phones within proper lens (Ex.7a), tripod solutions (Ex.7b), light (Ex.7c) and visual field (Ex.7d), which constitute the most important material for remote delayed feedbacks (Magill, 2000; Schmdit and Wrisberg, 2004; Lage, Borém, Benda e Moraes 2002, p.30-34), typical of distance learning.

The “30 Directed Double Bass Studies” were divided into 5 thematic areas in order to cover the instrument in an encyclopedic approach: (1) preparatory aspects for the beginner, such as body and instrument care, and instrumental practice routine issues (2) right-hand double bass techniques; (3) left-hand double bass techniques; (4) double bass styles and literature; and (5) daily studies of scales, arpeggios and bowings on the double bass.

Example 7

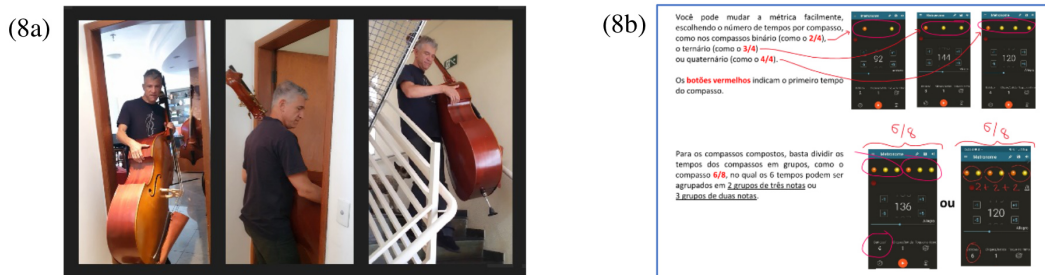
Instructions for self-tape recording with the cell phone: (7a) use the correct lens, (7b) tripod solutions, (7c) correct recording lighting, (7d) correct visual field.



In Thematic Area 1, “Posture and Routine of Double Bass Studies”, its 4 directed studies (from 1 to 4) cover basic questions in the study of the double bass, such as (1) posture, (2) physical preparation of the double bass player acquired outside the instrument (stretching and strength), (3) standing or sitting to play (4) how to carry and store the double bass (Ex.8a), (5) anxiety and stage fright, (6) intelligent use of the cell phone (tuner and metronome, Ex.8b), (7) sight-reading and (8) establishing a daily, weekly and monthly practice routine.

Example 8

Demonstrating (8a) how to carry the double bass and (8b) how to use the metronome in the Directed Studies from Thematic Area 1.



In Thematic Area 2, “The Right Hand on the Double Bass”, its 9 directed studies (from 5 to 13) deal with the production of sounds with the right hand with or without the bow, which are: (1) the differences and similarities (and the myths) about of the French and German bows, (2) the regions of the bow hair and respective articulations, dynamics and timbers, (3) the movements of the right upper limb (arm, forearm, wrist, hand and fingers) for using the bow, (4) the bow hair contact points on the string (Ex.9a) and the combination of pressure, speed and friction, (5) the sound envelope of the double bass in *arco* and *pizzicato* sounds, (6) *pizzicato* in concert music and popular music, (7) “on-the-string” and “off-the-string” bowings, especially the *detaché* and *spiccato*, respectively, (8) string crossing, and (9) the “20 Etudes for double bass open strings” book (Ex.9b), which is a series of etudes for daily practice using only the right hand, a strategy that takes into consideration the “freezing degrees of freedom” phenomena (Bernstein, 1967; Gray, 2020; Van Ginneken et al, 2018), which is the

intuitive need of beginners to reduce movement complexity. Therefore, the left hand is not used in them.

Example 9

Demonstrating (9a) a contact point on the string near the double bass bridge and (9b) an etude from the book “20 Open-String Daily Etudes for the Double Bass” in the Directed Studies from Thematic Area 2.



ESTUDO 14 do ED 13 – Staccato e staccato volante nas 3 regiões do arco (t - m - p): Esse Estudo visa a prática de dois tipos de arcada “na corda”: (1) o *staccato* (que produz notas curtas com mudanças de direção do arco); e (2) o *staccato volante* (que produz notas curtas na mesma direção do arco). Na arcada *staccato*, as semicolcheias permanecem na região do *talão*, e a semínima leva o arco *somente até o seu meio*. Já na arcada *staccato volante*, as semicolcheias levam o arco *até o seu meio*, e a semínima leva o arco *até a ponta*.

Ex.14 *Adagio* ♩ = 60

1ª vez: *staccato*

talão meio ponta meio talão meio não

sempre *p*

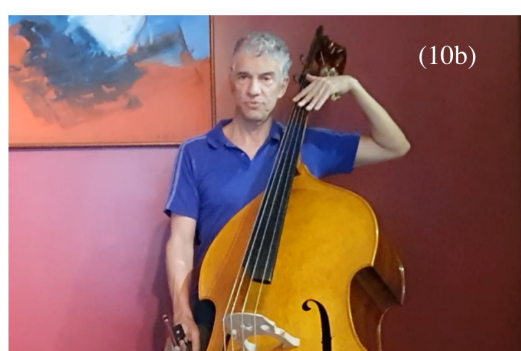
(9b) 2ª vez: *staccato volante*

talão ponta talão ponta talão ponta

In Thematic Area 3, “The Left Hand on the Double Bass”, its 10 directed studies (from 14 to 23) deal with the various techniques and fingerings both traditional (124 and 134) and modern (1234 and 01234), double bass intonation control using aural, tactile (Ex.10a) and visual information, longitudinal and transversal fingerings, fingerings with extensions, capo tasto fingerings in the high and low registers (Ex.10b), three subtle bow movements (change of direction, change of contact point on the strings, change of bow hair angle), *vibrato*, natural and artificial harmonics.

Example 10

Demonstrating (10a) a tactile search point in the double bass scroll with extension and (10b) a *capo tasto* position in the low register of the double bass in the Directed Studies from Thematic Area 3.



Thematic Area 4 combine music history and performance practices of the double bass. Its 5 directed studies (from 24 to 28) present the main style traits and double bass performance practices of the main historical music periods: Baroque, Classicism, Romanticism, 20th century and 21st century. In these studies, we converge elements of music analysis (such as form, phrasing and harmony), music history (historical performance practices) and the double bass repertory in order to allow a more informed performance. In order to facilitate the access to the instructional videos secured at the YouTube platform, we provided not only links but also correspondent QR codes (Ex.11).

Example 11

Instructions (11a) via QR code and links to access a Youtube video and (11b) respective timings leading to historical performance in “O Contrabaixo no Barroco” in an Espiral-SINOS video class.

(11a)



(11b)

Assista à videoaula **Contrabaixo - Aula 13 - O Contrabaixo no Barroco** no link <https://youtu.be/Ht7ecX3p7VY> ou no **QR Code** ao lado e, depois, faça essas 8 tarefas:



TAREFA 1 do ED 24 - Assista à videoaula no link <https://youtu.be/Ht7ecX3p7VY> [de 0:13 a 1:15]. Depois, grave um vídeo curto falando sobre o contrabaixo no período Barroco.

TAREFA 2 do ED 24 - Assista à videoaula no link <https://youtu.be/Ht7ecX3p7VY> [de 1:16 a 2:22]. Depois, grave um vídeo curto falando sobre envelopes sonoros dos arcos barroco, clássico e moderno.

TAREFA 3 do ED 24 - Assista à videoaula no link <https://youtu.be/Ht7ecX3p7VY> [de 2:23 a 3:13]. Depois, grave um vídeo curto falando sobre Barroco na França.

TAREFA 4 do ED 24 - Assista à videoaula no link <https://youtu.be/Ht7ecX3p7VY> [de 3:14 a 6:50]. Depois, grave um vídeo curto falando sobre o estilo eclético de Bach.

TAREFA 5 do ED 24 - Assista à videoaula no link <https://youtu.be/Ht7ecX3p7VY> [de 6:51 a 8:53]. Depois, grave um vídeo curto falando sobre o baixo cifrado na música e Vivaldi.

Thematic Area 5, “Daily Etudes on the Double Bass,” has 2 directed studies (29 and 30). First, the “Daily Etudes of Scales and Arpeggios with Extensions for the Double Bass” introduces the student to fingering patterns with extensions that allows him/her to play one-octave major scales (2-4-1-2-4-1-3-4) and minor scales (1-3-4-1-3-4-2-3) and their respective *arpeggios* in any tonality from the half position up to the first natural harmonics (one octave away from the open strings). Second, the “20 Daily Bowing Etudes for the Double Bass”, based on *Lesson 1* by double bass pioneer Lino José Nunes (1789-1747), brings the main types and techniques from the “on-the-string” and “off-the-string” bowing families. Ex.12 shows the instructions to Directed Study 15.

Example 12


Use of link and QR code for the student to access instructional videos and do the directed-study homework.

UNIT 3 – THE LEFT HAND ON THE DOUBLE BASS

Directed Study 15: Intonation Control on the Double Bass: Aural, Tactile and Visual Clues

Welcome to **Directed Study 15** of the **Espiral-SINOS Project** Double Bass Course! We are going to study the advantages of using 3 exteroceptive senses, that is, those whose stimuli come from outside the body – hearing, touching, and seeing – in an integrated way to better control the non-tempered double bass intonation.

Please, access and watch the video of **CLASS 10 – The Intonation of the Double Bass** in the link <https://youtu.be/7SPq8AORi8> or in the **QR Code** below, and then do these 3 homework tasks:



TASK 1 of Directed Study 15: Record a short video demonstrating on the double bass what you learned about the movements of fingers, wrist, arm and forearm to find the notes on the double bass, based on the video at [from 0:19 to 1:26].

TASK 2 of Directed Study 15: Record a short video demonstrating how to integrate hearing, sight, and touch to improve your double bass intonation, pitch better, based on the video at [from 1:27 to 3:42].

TASK 3 of Directed Study 15: Record a short video demonstrating on the double bass what you learned about the tactile cues and visual cues on the double bass, based on the video at [from 3:43 to 5:10].

The 5 Q&A Quizzes for the Thematic Areas of the Espiral-SINOS Double Bass Course

Besides the evaluation tool of self-tapes recorded by the students of their performances and reviewed by their double bass teachers, we also provided a more theoretical type of evaluation comprised of 60 Q&A (multiple choice questions) arranged in 5 quizzes (Ex.13) according to the 5 Thematic Areas of the double bass program. The strategy

behind these questions were (1) underlining the focus of the question, (2) being informative and reviewing the contents by including keywords in the 5 possible answers, (3) encouraging the student to make connections among the possible answers, and (4) using negative affirmations to force the student read more carefully the possible answers.

Example 13

Excerpt from a Q&A quizz with underlined words in the questions and keywords in the multiple choices used as an evaluation tool for the more overall and theoretical questions from the Espiral-SINOS Double Bass Course.

41- In which historical period of the double bass the Vienese violone emerges?
a) Baroque
b) Classicism
c) Romantism
d) 20th century
e) 21st century

42- In which historical period the separation between the double bass and the violoncello parts consolidates in the symphonic orchestra?
a) Baroque
b) Classicism
c) Romantism
d) 20th century
e) 21st century

43- In which historical period of the double bass the bowing enflé emerges?
a) Baroque
b) Classicism
c) Romantism
d) 20th century
e) 21st century

44- In which historical period the remote double bass performance consolidates?
a) Baroque
b) Classicism
c) Romantism
d) 20th century
e) 21st century

Conclusion

In spite of the tragic side of the pandemic on the music scene worldwide, music teachers had a chance to greatly develop remote teaching. The popularization of computer technology, especially in cell phones, allowed them to interact with their music performance students in home-office fashion as never before, even in less economically privileged classes attending social programs such as the Espiral-SINOS project in Brazil.

This educational project inspired this author to plan a double bass course of encyclopedic nature (in two phases), in which performance pedagogy had interfaces with other areas of music, namely composition, music history, music theory and music analysis. The collaboration between the composer and the performer allowed the former to strive for a more idiomatic writing at the beginner and intermediate levels in a series of double bass etudes addressing (1) right-hand techniques in open strings, (2) left-hand techniques in different types of bowings from the “on-the-string” and “off-the-string” families, (3) major-minor scales and arpeggios using extended fingerings, and especially, (4) the technical limits of beginner and intermediate students. The 21 instructional videos, the 30 directed-study instructional videos, and the 60-Q&A Quiz also resorted to knowledge from music history (such as relevant composers, works, style periods, traits

and historical performance practices), music theory (ear training, phrasing, sound envelope, ornaments), music analysis (such as elements of form, harmony and metrics) and motor control (such as exteroceptive stimuli, tactile and visual performing strategies) applied to the double bass.

Pedagogical strategies in the double bass course included (1) a combination of media formats (instructional videos, directed studies, online conferences and PDF evaluation tests), (2) instructions for students to produce self-tapes of their practice and polished performances using cell phones, inexpensive equipment and simple solutions, (3) use of QR codes and links in both instructional videos and PDF files of the directed studies taking the students to the YouTube platform. We hope that the knowledge accumulated by teachers of music performance in e-Learning and e-Teaching become part of daily routine even after the pandemic.

References

- Bernstein, N. A. (ed.) (1967). *The Co-ordination and Regulation of Movements*. Oxford: Pergamon Press, p.15-59.
- Borém, Fausto (2022a) *12 Estudos de Escalas e Arpejos para Contrabaixo sem Mudança de Posição*. Belo Horizonte: UFMG (partitura).
- Borém, Fausto (2022b) *20 Estudos para contrabaixo em cordas soltas*. Belo Horizonte: UFMG (partitura).
- Borém, Fausto (2021) *21 Videoaulas de contrabaixo-Projeto Espiral-SINOS*. In: <https://sinos.art.br/professor/fausto-borem/>. Rio de Janeiro: UFRJ, Funarte. (videoaulas).
- Borém, Fausto (2022c) *30 Estudos de arcadas para contrabaixo sobre a Lição N.1 de Lino José Nunes*. Belo Horizonte: UFMG (partitura).
- Borém, Fausto (2022d) *30 Estudos dirigidos para contrabaixo*. Rio de Janeiro: UFRJ, Funarte. (videoaulas).
- Borém, Fausto; Nogueira, Ilza. (2020) A Narratividade da cantora-atriz Martha Herr em Cantos, de Tim Rescala. *Revista Música*, v.20, n.1. DOI: 10.11606/rm.v20i1.168887. São Paulo: USP, p.1-18.
- Borém, Fausto. (2016a) "... Fucking Good!": Bossa Nova in Caetano Veloso's Words, Music and Images. *Art Research Journal*. Natal: UFRN/Abrace/Anpap/Anppom, p.113-156.
- Borém, Fausto. (2016b) MaPA and EdiPA: two analytical tools for text-sound-image relations in music videos. *Musica Theorica*. Salvador: Thema, v., n.1, p.1-37.
- Gray, R. (2020) *Changes in Movement Coordination Associated With Skill Acquisition in Baseball Batting: Freezing/Freeing Degrees of Freedom and Functional Variability*. *Frontiers of Psychology*. v.11. p.1295. June, 2. doi: 10.3389/fpsyg.2020.01295.
- Lage, Guilherme Menezes; Borém, Fausto; Benda, Rodolfo Novellino; Moraes, Luiz Carlos (2002) *Aprendizagem motora na performance musical: conceitos e aplicabilidade*. Belo Horizonte: UFMG, p.14-37.
- Ministério da Saúde (2022) *Coronavírus Brasil – COVID19 – Painel Coronavírus*. Ministério da Saúde. In: <https://covid.saude.gov.br>. (Access and update on July 11, 2022).
- Magill, Richard; Anderson, David (2000) *Motor Learning and Control: Concepts and Applications*. 16th edition. Columbus, Ohio: McGraw-Hill Education.
- Mseleku, Zethembe (2020) A Literature Review of E-Learning and E-Teaching in the Era of Covid-19 Pandemic. *International Journal of Innovative Science and Research Technology*. v.5, n.10, October, ISSN No:2456-2165, p.588-597.

- Projeto Espiral-SINOS (2022) *Projeto Espiral-SINOS*. In: <https://sinos.art.br/projeto-espisal/>. Rio de Janeiro: UFRJ, Funarte.
- Schmidt, Richard A.; Wrisberg, Craig A. (2004) *Motor Learning and performance: a problem-based learning approach*. Champaign, Illinois: Human Kinetics.
- Van Ginneken, W. F.; Poolton, J. M.; Capió, C. M.; Van Der Kamp, J.; Choi, C. S.; and Masters, R. S. (2018). *Conscious control is associated with freezing of mechanical degrees of freedom during motor learning*. *Journal of Motor Behavior*. v.50, p.436-456. doi: 10.1080/00222895.2017.1365045.