

## Didactic strategies for learning the trombone post COVID. An experience in development

### Estrategias didácticas para el aprendizaje del trombón post COVID. Una experiencia en desarrollo

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#### Abstract

The development of the quality and interpretative level of a music professional is made up of an accumulation of cultural elements that together can guarantee an optimal performance of the instrumentalist. The practice of the trombone within the state of Zacatecas, Mexico, is currently very relevant and it is for this reason that within the Academic Unit of Arts of the Universidad Autónoma de Zacatecas is offered, for many years now, the specialization in the instrument; However, the health situation experienced in previous years has caused situations that have decreased student enrollment within the chair. This document aims to expose the actions that are being carried out from the trombone class to guarantee the continuity of studies of the students who make up the student plant, as well as to continue their academic development. This results in an analysis to observe the relevance of a future modification of the educational model in the trombone career.

**Rod trombone, Educational modality b-learning, Instructional design**

#### Resumen

El desarrollo de la calidad y el nivel interpretativo de un profesional de la música se encuentra conformado por un cúmulo de elementos culturales que en conjunto pueden garantizar un óptimo desempeño del instrumentista. La práctica del trombón dentro del estado de Zacatecas, México, actualmente es muy relevante y es por tal motivo que dentro de la Unidad Académica de Artes de la Universidad Autónoma de Zacatecas se ofrece, desde hace muchos años ya, la especialización en el instrumento; no obstante, la situación sanitaria vivida los años anteriores ha causado situaciones que han disminuido la matrícula estudiantil dentro de la cátedra. Este documento tiene como finalidad el exponer las acciones que se están llevando a cabo desde la clase de trombón de vara para garantizar la continuidad de estudios de los alumnos que conforman planta estudiantil, así como, que continúe el desarrollo académico de los mismos. Lo que trae como consecuencia un análisis para observar la pertinencia de una futura modificación del modelo educativo en la carrera de trombón de vara.

**Trombón de vara, Modalidad educativa b-learning, Diseño instruccional**

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## Introduction

During the years 2020, 2021 and part of 2022, humanity suffered the onslaught of the health pandemic known as Covid-19, which among other consequences, in addition to health, brought with it changes in all spheres of human daily and social life; one of the most affected was education, where strategies had to be implemented to meet this new challenge of caring for the health of the student population and not leave to their fate those who were eager for knowledge.

The main measure taken worldwide was to use a distance education model (e-learning or virtual), taking advantage of the benefits currently offered by ICT; artistic education was not left behind and implemented didactic strategies in the best way to continue the teaching-learning process. Today we can consider a gradual return to the usual activities without neglecting them, however, the question arises: Is it possible to take advantage of the strategies and models used during the pandemic in the form of teaching in the musical arts? How to carry out the Instructional Design for teaching instrument classes, for example the trombone, through the use of Educational Technology and under a distance learning model?

The study of the trombone at a professional level, in itself, is already a challenge traditionally faced by students and teachers, because although there is an abundant bibliography, it is currently complex to apply a methodology, as well as to have a manual of activities for its instruction; in the words of Kleinhammer and Yeo (2012), worldwide, some study manuals have been created for the instrument (trombone), which respond to the needs of the students who are part of the institutions, which in turn depend on the geographical region.

The Trombone is an aerophone instrument of the brass family, consisting of a cylindrical brass tube, approximately 3 metres long, bent on itself and connected to a conical section that widens in the shape of a bell, it has a mouthpiece that is attached to the tube at its narrowest part.

The sound is produced by the vibration of the player's lips on the mouthpiece, modulating the column of air through a movable tube, called a rod, which slides inside the main tube, shortening or lengthening the distance that the vibrating air must travel and thus altering the resonant frequency, thus producing bass or treble sounds. The telescopic rod was invented in the 15th century and its handling allows seven positions that complete the chromatic scale. In the brass family, it usually plays the role of tenor or baritone with a lower register than the French horn.

There are also trombones with valves, the first trombones did not have pistons and were introduced during the 19th century. The piston trombone is the one most frequently used in Sinaloa bands and/or tamborazos.

Like most wind instruments, the trombone had its origin in the hollow bar and horns of animals, the evolution of this instrument is related to the primitive trumpet imported from Egypt, the ancient trumpet was straight in shape, in its upper end a mouthpiece was inserted, while its lower end was widened in the shape of a bell, often representing the head of an animal. There have been various transformations, and it is from it, and particularly the "Buccina", called Bausaun, in the 16th century that Rieman derives the German name for the trombone: "posaune".

In the course of the 14th and 15th centuries the aerophone instruments of war gave way to other non-military instruments such as the sackbuts and trumpets, which together with others such as shawms and oboes came to swell the large number of European instruments. In the 1400s, as a further development of the trumpet, the trombone was made in various sizes. With the exception of the thicker metal and the narrower bell, which produces a softer and more delicate sound, the early trombone was almost identical to the one of our days, known by the name of sacabuche because of its resemblance to a weapon of the same name, the most common instruments were the alto, tenor and bass. It was a very appreciated instrument in religious and chamber music, documents from the 15th century indicate the existence of ensembles of oboes and sacabuches, the name given to the ancient trombones in Italy.

During the baroque and classical periods it was widely used in religious music, it was introduced in the great military bands at the beginning of the 18th century and it was then when it enlarged the pavilion to the size of the current ones. Since the 19th century it has been indispensable in the great symphony orchestra, to which Berlioz and other important composers of the time contributed; it was Wagner who gave it a stable position.

At the Academic Unit of Arts of the Universidad Autónoma de Zacatecas (UAAUAZ), the teaching of the trombone is part of the wide range offered within the Bachelor of Music programme with emphasis on the instrument, within three of its teaching levels, Basic Level, Upper Intermediate Level and Higher Level.

It is well known that traditionally music teaching has been based on a method of imitation by reproducing what the teacher shows, in order to achieve the necessary skills for the execution of a musical instrument, well, the trombone class at the UAAUAZ does not differ from the above.

The state of Zacatecas is characterised by its cultural richness and more specifically in music, where proof of this are the famous callejoneadas, which are accompanied by the traditional Zacatecan tamborazo and obviously mezcal, the tours of this tradition generally have a duration of two hours and sometimes this type of event is accompanied by Sinaloan type bands.

The trombone class at the UAAUAZ is mainly made up of young people who come from these types of musical groups and also from military bands, who are looking to improve their playing of the instrument.

Among the needs that the future graduates of the trombone degree wish to cover are the development of technical aspects of the instrument and the desire to increase the level of interpretation for an early insertion in the labour market.

The aforementioned unit provides service not only to individuals from the municipal capital of the state, but also incorporates students from other municipalities in the state, its surroundings and from all over Mexico, where the labour market requires instrumentalists with a good level and great versatility to interpret the great variety of musical genres that make up the musical culture of the country.

Traditionally, the teaching of the trombone worldwide and at the Academic Unit of Arts of the UAZ has been developed under a formal and presential educational model supported by methods of reproduction and imitation.

Under this approach, the aim is for the future performer to develop the objectives set out in the programme and to acquire an adequate technique in order to look after his or her health and to evolve as a professional.

Technique is the development of specific abilities that allow the musician to master all the possibilities offered by the instrument, these possibilities can be seen in the literature that composers have bequeathed over time through repertoires that continue to increase, as well as the mastery of skills in handling the instrument. (Junta de Andalucía, s.f., p. 6).

For the development of the instrument's technique, its execution and interpretation, it is necessary to master four main parameters, which benefit in obtaining an optimum level as trombonists, these are: flexibility, articulation, intonation and sound.

The first of the parameters mentioned, flexibility, can be translated as the work that the air must do when passing through the different harmonics where the lips present the least possible tension or, failing that, almost without forcing them; carrying out flexibility exercises allows one to fix the adequate amount of air and lip tension for each note and register.

In the words of Schlossberg (1992), a basic principle that needs to be implemented in the practice of a flexibility exercise is that of minimum muscular effort, maximum air; each harmonic needs a different amount of air and a different state of muscular relaxation that will always be the least tense possible.

Articulation is the action of articulating several syllables with the tongue when playing the trombone, for example: ta, te, ti, to, tu, da, de di, do, du, among others; according to Kleinhammer and Yeo (2012) when articulating, the aim is to make it as smooth as possible, always focusing on the vowel and not the consonant.

For its part, the work of tuning is based on the ability to listen to the subtle differences between two sounds, which as practice becomes easier to demonstrate; listening to the sounds will allow the instrumentalist to realise when the trombone is in tune, Pagan-Perez (2012) explains that the practice of tuning the instrument every day with an external source of sound will help to improve the ear which will result in it being easier to play in tune.

Finally, to produce a quality sound, a deep outward breath is required, Valdés (2013) explains, for which the window must be maintained without cutting off air production; this air should be warm for the low register and cold for the high register.

One element to which special attention must be paid is breathing, which is the foundation not only of trombone playing but of all wind instruments, and must be deep and very relaxed.

The process of achieving controlled breathing is influenced by many factors such as the position of the mouthpiece on the lips, the way of inhaling and exhaling and mainly by body organs such as the diaphragm and the lungs; good breath control can guarantee the note the student intends to play.

Another aspect that should always be under great care when studying the trombone is the body posture of the instrumentalist, it is of vital importance that it is taken into account in the teaching from a very early age.

A bad posture can not only affect the interpretative performance, but can also lead to a greater expenditure of energy due to increased muscular work and even affect the health of the player.

It is a fact that the return to postcovid face-to-face educational activities and the mainly economic needs of Mexican families due to the health situation have reduced the number of students in the music degree with emphasis on trombone, even causing the desertion of students who were in the UAAUAZ programme.

A possible solution is to adapt the instructional design (ID) of the course to include Educational Technology (ET), which will favour the application of a distance learning educational modality where students will be able to face the situations that cause absenteeism and therefore lead them to drop out of the course without having reached the goal of a level as instrumentalists that will allow them a quick insertion in the labour market within groups such as chamber orchestras, symphony orchestras, musical ensembles, tamborazos, bands, etc.

When talking about educational modality, Barroso (2006) considers it as the way in which an educational product is presented, which is made up of administrative processes, planning of didactic and learning strategies.

Naturally, the technological advances that are evident today have been modifying the educational models that have traditionally been developed in educational centres; however, for several years now, a significant group of universities and schools have been adopting the new models that have been created with the influence of ICT, and one of the aspects, among many, that have highlighted the pandemic in the educational sector is the need for all centres to continue the development and use of distance education models such as b-learning and e-learning.

Distance education or training is a current possibility and many institutions are seeking to provide this service in addition to face-to-face training; this undoubtedly allows access to multiple users who demand training. The new communication and information platforms offer advantages for educational institutions to enhance their reach and provide educational coverage to interested populations (Ocampo, Gómez, & Zambrano, 2015, p. 3).

The educational model proposed for the delivery of classes is a mixed educational model, which presents a part of the programme is developed face-to-face, while the other can be carried out with distance activities, Barroso (2006) states that this model is a mixture between the face-to-face models, where technology can be used for certain activities without modifying its original operating structure, and the distance model (e-learning) where technology is the one that governs the teaching-learning process.

Therefore, the performer's performance is mainly assessed in a face-to-face manner to address parameters that require immediate correction and in some cases even physical contact.

Breathing instruments have the particularity that an important part of their execution and technique is performed inside the body, where it is impossible to have a visual reference, and for these characteristics, the explanations and examples of the teacher are more effective through direct and face-to-face contact. However, it is also possible to work on other aspects of performance that depend on the vision and hearing of both the student and the teacher, where technological and computer tools offer sufficient quality and certainty to be developed virtually.

These virtual activities allow for great dynamism as they can be carried out synchronously and asynchronously, for example, lessons and exercises can be provided to students through video tutorials and podcasts that will also serve as a didactic repository that will always be available for consultation.

In the b-learning model, the selection and discrimination of appropriate media that respond to the educational need is inevitable. This model offers greater flexibility where the learner can learn at his or her own pace and in a more dynamic way, positively influencing the result.

For their part, Núñez-Barriopedro, Monclúz and Ravina-Ripoll (2019) mention among the advantages of blended-learning the availability of content and information that can be shown to the learner, which can be easily updated, the promotion of the autonomy of the learner, who is largely responsible for their learning, the creation and transmission of information and synchronous and asynchronous communication between teacher and student.

All of the above must be planned by means of an Instructional Design that will allow the establishment of objectives, methodology, tools and means of instruction under which the teaching-learning process will be ensured.

The ID is the work on the table before the implementation of a course, so it is considered essential to be able to carry out the implementation of the latter.

In the words of Dick, Carey and Carey (2001) cited in De la Torre and Sosa (2018) instructional design is "the systematic method to analyse, design, develop, evaluate and manage the teaching process efficiently, based on knowledge and experiences of learning and teaching theories" (p. 5).

It is no less true that DI helps in the planning of the course and points the way to take during the implementation of the course, always having the learner and the ways of teaching as the main focus.

It is recognised that there are several models of Instructional Design, however, due to their characteristics there are two that are proposed as preferential, the ASSURE model and the ADDIE model.

The ASSURE design (Analyze learners, State Objectives, Select media and materials, Utilize media and materials, Require learner participation & Evaluate and revise) favours locating and discovering the characteristics of the learners who will be the centre of the whole process, once these characteristics have been determined, it allows establishing the objectives of the subject, selecting the materials and resources to be used for the teaching process, making use of these materials and resources, requiring the participation of the learners and finally evaluating.

This final stage is carried out in two ways, one where the knowledge and skills acquired during the teaching-learning process are evaluated and the other where the evaluation of the process itself is carried out, which allows the adaptation and/or modification of some of the elements that are presented in the design and during the implementation of the course. This evaluation of the process is carried out by the students and in the form of self-evaluation by the teacher, and it is necessary to be as objective as possible in order to seek to improve the process itself in subsequent semesters.

The ADDIE model (Analysis, Design, Development, Implementation & Evaluation) is an interactive model. It is characterised by the fact that the results of the formative evaluation of each of its moments enable its designer to go back to a previous step; consequently, the end of one period is the beginning of the next one.

It was considered under the conception that each phase is applied and in turn evolves through the others until the desired objective is achieved, the resources and materials of the instruction are obtained through the application of its phases.

These models are flexible and have a great capacity for adaptation, which favours their reuse in correspondence with the characteristics of the assumed approach, which in this case proposes a constructivist approach as it takes the student as the central axis, its characteristics and flexibility of learning, the instruction from the construction and the experience that the student develops.

The planning of DI, with the use of either of its two models, will allow for the development of a balance between the classroom sessions, i.e. face-to-face, and the activities that the learner can develop in a self-taught way with the use of technology.

An important part of this whole process is the use of Educational Technology, which González and Flores (2020) define as the complex that encompasses communication media and didactic and teaching methods used in education in order to provide elements of useful practices in the teaching-learning process.

The implementation of the exercises and practice to strengthen the basic parameters within the technical study of the trombone are proposed to be introduced and explained during the face-to-face meeting in the classroom, so that later during the rehearsal process, individually and making use of technology, they can be carried out and/or revised online, which will favour progress in academic performance; It is worth remembering that in this educational modality, the responsibility for learning lies mainly on the shoulders of the student, so that discipline and seriousness during daily practice at home are of great importance in the achievement of interpretative competences.

It should be noted that the technological tools with which it is proposed to work virtually are what we know as free software or free licence software; they do not necessarily have to be paid for, however, if you have the resources to acquire one or more technological tools, you are welcome to do so. The study of the basic exercises such as articulation, sound and tuning is very important to maintain the concentration and focus of each of the parameters, as well as, that the student does not have the slightest doubt about how, why and for what he is going to study, that is to say, that there are no gaps in the study of any of the basic parameters.

Before starting any study, it is essential to explain to the student everything relevant to the position of the instrument and its consequences if it is done in the wrong way, and for this it will be necessary to explain it first during the classroom.

At the beginning, the two ways of playing the instrument, standing or sitting, are explained. When playing standing, it is necessary to ensure that the shoulders are well relaxed and the spine is straight, which can be done by positioning the student close to the wall with his head up and then taking a step forward without leaving the posture, when playing in a seated position, it is recommended that they sit in the middle of the chair, never leaning back against the back of the seat, with their feet at an angle of approximately ninety to ninety-five degrees and keeping their face straight in front of them; in both positions the trombone will be supported on the left shoulder and forearm and it is good to place a grapefruit between the chin and the spine, or alternatively it can be the fist, and without tensing the muscles try not to throw the citrus fruit while playing.

For the development of the praxis at home, it is proposed to use the following resources that will provide knowledge and advice in the self-taught work.

A first useful tip is that the student tries to study where there is a mirror, this will allow them to correct themselves and compare their posture with respect to the work done in the classroom session and with the materials that the teacher will provide; in the event of not being able to have a mirror, they can also use a mobile phone and record every moment of the practice to later rectify and/or correct bad habits.

The first resource proposed is to make a short presentation on the benefits of having a correct posture and the disadvantages of the bad habits that can be acquired by not paying due attention to this; this helps the learner to become aware of the benefits in terms of health and quality of this aspect.

Another resource that can be used is the creation of a didactic and tutorial video where the correct posture on the instrument is explained and exemplified; during this video, whose duration is suggested to be no more than five minutes, the teacher, while explaining the exercise, demonstrates the correct poses and how to achieve them, this will allow both those students with a visual learning style and those with auditory and kinaesthetic learning styles to activate the most conscious way of acquiring knowledge.

It is worth noting that this work will be constant and daily, as good habits must always stand out, and on this occasion the correction and suggestions that the teacher must make, as well as the progress of the student, can be reflected in activities that will be developed according to the basic parameters.

Another very important section is the warm-up exercises that will help us to perform better on our instrument; one recommendation is to carry out the activities developed by the musicians Sheridan and Pilafian (2008) in their book *The brass gym*, the introduction of these exercises must first be carried out under the supervision of the teacher, so it is recommended that they be done in the classroom and in person until they are mastered.

These exercises develop the internal spine, expand the lung capacity and the diaphragm through exercises that should always be performed as a warm-up before the instrumental practice, so that the blood at rest begins to circulate and prepare the heart rate to begin the study routine.

Another warm-up exercise that can be performed is that of placing the hand in a vertical position and with the palm facing to one side, if it is the right hand it will face to the left and if it is the left hand it will face to the right, place the hand in front of the mouth at the height of the index finger, precisely in the bone that joins the palm, in the mouth which should have an O shape and inhale deeply and without tensing any muscle, trying to fill the lungs as much as possible, and then let all the air out.

If this exercise is done correctly, an expansion of the entire rib cage can be observed when air is taken in to fill the lungs and while inhaling, a sound of absorption will be emitted, while if it is not done correctly, nothing will be heard and it will be evident that only the shoulders will be lifted, since only the upper part of the lungs will be filled.

Once again, it is suggested to work in front of the mirror, a resource that will be of vital importance during each and every moment of study, or, failing that, self-recordings with the mobile phone.

Similarly, video can be used as the main didactic resource for the tutorial, where the learner can have a guide and/or reference on how to work.

In addition, it is recommended that the practice incorporates the use of the metronome which will allow the duration of each of the parts of the exercise, for example: metronome speed sixty BPM (Beats Per Minute) and that the inhalation lasts four beats and the exhalation another four, giving control over the breathing.

As an activity, a video of the exercise can be requested to provide feedback.

This exercise can have a variation, where air retention is added between the moment of breathing in and the moment of breathing out.

Once the necessary warm-up exercises have been completed, work can begin on the basic execution parameters.

Within the articulation parameter, the different types of articulation according to the register are explained. It should be noted that this session is face-to-face and begins with the following syllables: for the low register, Tho is pronounced, for the middle register, thu, and for the high register, the syllable thi is used. It is suggested to study the exercise with a metronome, starting with rhythmic figures of quarter notes at 80 bpm in 4/4 time signature and decreasing the speed five by five bpm until it reaches 60 bpm and then returning to the initial value and increasing it five by five until it reaches 120 bpm. The low register begins with the low B flat scale and descends its seven positions from B flat to E low. In the same way the low register (tho) is studied. For the middle register the suggestion is from the B flat to the E (thu). And finally the D to G sharp (thi).

This exercise will be worked on virtually with various resources, one of them is presented as a video tutorial where the teacher explains and explains what should be done, another that can be suggested is to record a podcast where the teacher executes the activity as an example, the audio made by the teacher can also serve as a means of evaluation and self-evaluation of the student by asking him to make a video recording where at first the audio provided by the teacher is heard and then the student is asked to do the activity alone; The video recording made by the learner should be uploaded to a YouTube channel where it will serve as a repository of evidence for possible clarifications and doubts, this is of course a suggestion, however, it is an excellent proposal.

It should be noted that only permissions will be allowed for the teacher to review the progress of the student to avoid possible conflicts on the network, another option is the peer review resource where peers of the learner in question participate in the feedback, for this technological tools such as the LMS-Moodle workshop activity are suggested.

The tuning parameter can be approached in different ways; firstly, it is a task that must be carried out in conjunction with the Solfège subject, so the work criteria must be unified and coherent, and we will not go into this aspect in detail for the moment. For its part, within the instrument class in the classroom, it is recommended that a piano or keyboard can be used and the reproduction of diatonic scales where the guide of the teacher can rectify the tuning by adjusting how much air should be used or the position of the stick, which allows the ear of the future trombonist to be educated.

From the virtual world, the use of the Ear Master software is recommended, in principle this was created for the practice of auditory training, but in an instrument such as the trombone it allows the student to work on tuning through the reproduction of sounds; this software provides the student with a musical note with a duration and then asks him to play it while recording an audio within the same programme, which processes the information and if the performance is correct it moves on to the next, if it is deficient it emits the sound of the note so that the student can identify his error and imitate the sound as accurately as possible.

Another resource that can be used are digital tuners, which will provide the student with a sound reference of the notes to play and thus be able to rectify the interpretation; there are applications and websites that provide this service free of charge.

The interpretation of scales, as mentioned above, can be a very important reference within this parameter, so as an assessment, the student can be asked to record short videos and audios that will later be sent to the teacher, who will provide feedback.

The next basic parameter is the sound and the suggestion is to make them, supported by the metronome, in a slow tempo of 60 bpm and focus on the round, warm and in tune sound. An important recommendation that can be included is to use the flater or flurulato as it is also known, this will allow us a better sonorisation and amplitude of sound, as well as the improvement of the centre of each of the notes. The use of the low and middle register sticks is also recommended.



The exercises for sound work can be carried out both in person and virtually, the latter being supported mainly by tutorial and performance videos made by the teacher, as well as audios that will serve as examples for student practice. The use of the metronome is once again required, as well as careful tuning. For the evaluation of the results and feedback, the student can be asked to make video and audio recordings which will be sent to the teacher as well as to the students' peers who will be able to give constructive criticism.

To work on flexibility, resources such as the digital metronome will be used again and it is recommended to start at a tempo of 80 bpm and gradually decrease the metronome measure five by five, this is to equalise the cleanliness of the interval in the exercise, the objective would be to reach 60 bpm and then return to 80 bpm and go up five by five until the objective is reached, which would be 120 bpm. The exercise can start with the F scale and its following harmonic which is B flat. You can start in eighth notes and then do it in sixteenth notes all in 4/4 time signature.

Once again, this exercise can be carried out in the classroom and also virtually, where once again the main technological resources will be videos and audios, applying the same principle as in the didactic work on the parameter explained above.

Although the order in which the work of the parameters is presented in this document has been governed by one of the study routines that are put into practice in the trombone class of the Academic Unit of Arts of the UAZ, this may vary for each class session.

During the implementation of the course, constant evaluation is necessary either through the activities that can be integrated into the virtual and also in the classroom, through the application of exams where the future trombonist demonstrates the interpretative skills acquired during the semester.

The evaluation of the course and its development will also be carried out by the students and teachers outside the class, which will allow the contents, materials and resources used to be modified and/or adapted for a better performance, always having the students as the focus.

## Conclusions

This article is a suggestion of what can be worked on in a trombone class, taking into account some of the learning theories such as constructivism.

The teaching-learning process in music, especially in an instrument class, is constantly changing, which is why the teacher and/or instructor must be constantly updating.

Technological resources and/or Tics are currently of great support for the teaching-learning process and we must continue to make use of them in favour of music education.

Each of the parameters presented, as well as the recommendations and/or suggestions have been previously reviewed for their implementation, development, evolution, evaluation and praxis for an adaptation of the programme within the UAA-UAZ to the b-learning modality.

It is necessary to continue implementing the hybrid modality for the development of the students within the teaching-learning process as it demonstrated within the trombone course a better development in its formative process. Continuing with the commitment to updating the teaching staff.

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