

## The learning of the piano technique in Higher Artistic Education: a study on the perspective of the student body

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**Abstract.** This article characterizes the learning of piano technique in regulated education, in centers that teach Higher Artistic Education and in the specialty of Interpretation in Spain. For this, a questionnaire was designed and validated, and later applied to the population. The resulting sample amounts to 122 people. The objectives of the study were descriptive in nature and intended to characterize the profile of the students and learn about their conceptions about piano technique. They also aimed to establish a theoretical paradigm about the teaching-learning of this subject at present which would contemplate the resources available and used to their learning, the evaluation processes and the demands of the students for the improvement of the technical mastery of the instrument. The results obtained indicate that the questionnaire is valid and reliable to measure the stated objectives. This study is the first carried out on the teaching-learning process of piano technique in Spain and the conclusions allow us to advance in its knowledge and improvement.

**Keywords:** technique; piano; Interpretation; Higher Artistic Education; questionnaire; validation.

## [es] El aprendizaje de la técnica pianística en las Enseñanzas Artísticas Superiores: un estudio sobre la perspectiva del estudiantado

**Resumen.** Este estudio se centra en el aprendizaje de la técnica pianística en la enseñanza reglada, en los centros que imparten Enseñanzas Artísticas en la especialidad de Interpretación en España. Para ello, se ha diseñado y validado un cuestionario, que posteriormente se ha aplicado a la población, siendo la muestra resultante de 122 estudiantes. Los objetivos son de carácter descriptivo y pretenden averiguar las concepciones que tiene el alumnado sobre la técnica pianística, así como conocer el paradigma teórico sobre la enseñanza-aprendizaje de esta materia en la actualidad con los recursos disponibles y empleados para su aprendizaje, los procesos de evaluación y las demandas del estudiantado para la mejora del dominio técnico del instrumento. Los resultados obtenidos indican que el cuestionario es válido y fiable para medir los objetivos planteados. Este estudio es el primero realizado sobre el proceso de enseñanza-aprendizaje de la técnica pianística en España y las conclusiones permiten avanzar en su conocimiento y mejora.

**Palabras clave:** técnica; piano; Interpretación; Enseñanzas Artísticas Superiores; cuestionario; validación.

**Summary.** 1. Introduction. 2. State of the art. 3. Objectives and methodology. 4. Treatment of the piano technique according to the teaching guides. 5. Populations and samples. 6. Design and validation of the questionnaire. 7. Results and discussion. 8. Conclusions. 9. Bibliographic references.

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## 1. Introduction

Throughout history, numerous texts have been written on the study of piano technique. The study of the piano technique is essential to achieve an optimal musical interpretation. It has involved mirroring the musical language used by composers, in order to exploit the sound and mechanical possibilities of the piano as an instrument. Within the technical production for piano, one can distinguish between methods, treatises, collections of exercises and studies.

Method is understood as the compendium of a series of progressive exercises that characterize the way of conceiving the piano practice of a given school (Rattalino, 1992). Unlike the method, which usually covers the technical parameters exhaustively, the treatise can focus on some specific aspect of piano technique and is usually focused on theory that is completed with musical examples and/or exercises. On the contrary, collections of exercises lack theory and simply systematize a series of mechanism formulas for their practice.

The study is a musical composition designed to overcome some technical difficulty, using the repetition of the base formula in its original or varied format. It differs from exercises in its artistic content and when they aim to demonstrate the performer's virtuosity it is called Concert Study (Oliveira, 2015).

The piano student body of the Higher Artistic Education in Spain is based on the use of all these resources for the improvement of their instrumental technique. Along with the above, essays and informative works covering general themes of performance comprising the experience of their authors, who are usually prestigious pianists and pedagogues (Deschaussées, 1982; Neuhaus, 2004; Nieto, 2020).

## 2. State of the art

Chiantore (2001) argues that the available theories on technique do not offer a neutral panorama and tend to lean towards a particular author. The author offers an itinerary through the different technical currents, from the first didactic texts on the keyboard, understanding that "the physical dimension of the execution is a decisive moment in that process of confrontation with the personality of the author that constitutes the core of any interpretive act" (p. 14). On the other hand, Gerig (2007) highlights in his study that much of the technical literature that has been written for the instrument is forgotten today. Finally advocating for a scientific study of movements, is the text by Kaemper (1968), to whom we owe the inclusion of the term "technology" (p. 8), in reference to the theorization of technique made by the theoretical based on the practices of the great pianists and composers.

Previous research focuses on the history of didactic works and on the practices of pianists that were widespread at the time and of which testimonies remain. The same point of view is found in other studies such as Golz (1944), Mimaki (2010), Norman (1969), Spangler (1950) or Tzotzkova (2012).

In Spain, an approach to the pedagogical practices of the 19th and 20th centuries can be found in some of the works edited by Cuervo (2012) and Gómez-Rodríguez and García-Flórez (2015). The first offers an analysis of piano technique and repertoire and the second a historical journey through the regions of the country.

Although two-handed performance is common, several pedagogical works have been written for the pianist's left hand alone, as well as for the right hand alone, the latter in lesser number (Patterson, 1999). The history of the technique and compositions for the left hand alone have been studied by Drozdov et al. (2008). The results of his research indicate that Paul Wittgenstein and Siegfried Rapp played a fundamental role in the establishment of practices and repertoire.

From the point of view of the pedagogy of the instrument, Uszler (1991) makes a synthesis of content and methodology focused on the beginner, intermediate, advanced, and professional level. In Spain, Nieto (2006) elaborates a taxonomy of the contents that should be treated in each of the educational levels of the country's regulated education. Unlike Uszler (1991), here the historical, methodological and bibliographic part is excluded, in order to focus on the theory.

Up to this point, some of the historical research focused on the practices of the past have been treated. However, descriptive research has been carried out focusing on addressing the reality of teachers and students at the present time, which, in addition, are more similar to the research presented here, since they share some of the instruments and research techniques. Among these, in Spain, Gil (2010) carries out a case study at the Higher Conservatory of Music of Vigo, which, apart from the technical and interpretive elements of piano performance, addresses other issues such as study plans, the infrastructure of the center, and the satisfaction of the teaching and student community.

Regarding the descriptive studies on the subject, some of them focus on specific technical skills, as in the case of the pedal (Curbelo, 2013; Keil, 2015) or sight reading (Corredor, 2019).

At an international level, a comparison between institutions in the United States and China indicates that study overload, anxiety management, and rote learning are the challenges that students face (Jiang, 2019).

Among the proposals to improve the methodology of the piano subject, the relevance of including elements of piano didactics in the specialty of Interpretation can be pointed out (Lennon, 1996; Sepp et al. 2013). At the same time, the benefits of implementing a diary monitoring in advanced piano students (Woronchak & Comeau, 2016), the promotion of self-regulated learning and critical spirit (McPherson et al., 2017; Miksza, 2015; Zimmerman, 2002)

and the use of new technologies creating virtual learning environments (Aufegger et al., 2017; Hadjakos et al., 2008; Zhu et al., 2013) are also relevant.

The need for dialogue between Higher Education institutions, and within their teaching staff, has been highlighted in the conclusions of other works such as Abankwa & Mikkilä (2018), Abdel (2010), Baéz (2019), Botella & Isusi-Fagoaga (2018), Castro (2015), Escorihuela (2017), Juntunen (2014) or Meissner & Timmers (2020).

According to this previous analysis, it can be concluded that in Spain no descriptive research has been carried out on the learning practices of Piano students in the specialty of Interpretation, neither focused exclusively on the processes of learning and teaching of the technical elements of the piano. For this reason, having noticed this gap in current scientific production, it is necessary to investigate the learning practices of the piano technique used by students and the problems they must face.

### 3. Objectives and methodology

The objectives of the research are synthesized in four main points, which are the following:

1. To know the academic and professional profile of the students surveyed.
2. To characterize the study of piano technique within the Spanish Higher Conservatories of Music.
  - a. Know the resources available to students for the study of piano technique and its use in Higher Music Education.
  - b. Determine the types of evaluation of the piano technique currently in force in these institutions.
  - c. Discover the possible improvements in the field of teaching and learning piano technique according to the opinion of the students.
3. To understand the conceptions about the piano technique that the students have.
4. To gain insight on the theoretical paradigm on the teaching-learning of the piano technique in current conservatories.

As a descriptive study, and given the nature of the chosen topic, it was decided to use methodological triangulation, so that the quantitative technique of the questionnaire would be completed with the qualitative procedure of content analysis. The latter has been used for the study of the teaching guides of the subject and the open questions of the questionnaire.

### 4. Treatment of the piano technique according to the teaching guides

In order to know the technical resources that the piano teaching guides contemplate in the Interpretation itinerary of the Spanish Higher Conservatories (public) and similar institutions (private), the official web pages of said centers have been consulted and the relevant documents have been downloaded.

Prior to this work, it was necessary to develop a taxonomy of the Spanish centers that offer these degrees. To do this, the information provided by the Ministry of Education and Vocational Training (MEFP, 2020) was consulted. A total of 37 University and non-University Teaching Centers were found. However, teaching guides were only obtained from 19 centers, which represents 51% of the total, because the rest of the institutions did not have the document on their website. From the analysis of these teaching guides<sup>4</sup>, it has been observed that the most used resource is that of Chopin's studies, which account for 8.9% of the total works recommended for use during the training of the professional pianist in the stage of Higher Education. The rest of the repertoire of studies recommended in the teaching guides dates from the middle and end of the 19th century –Liszt and Scriabin, respectively– and from the beginning of the 20th century –Rachmaninov, Debussy–.

Along with the repertoire of studies, there are texts that theorize about aspects related to piano technique and keyboard performance, as shown in Figure 1:

<sup>4</sup> The ATLAS.ti 8 program was used for the coding and subsequent counting of the resources.

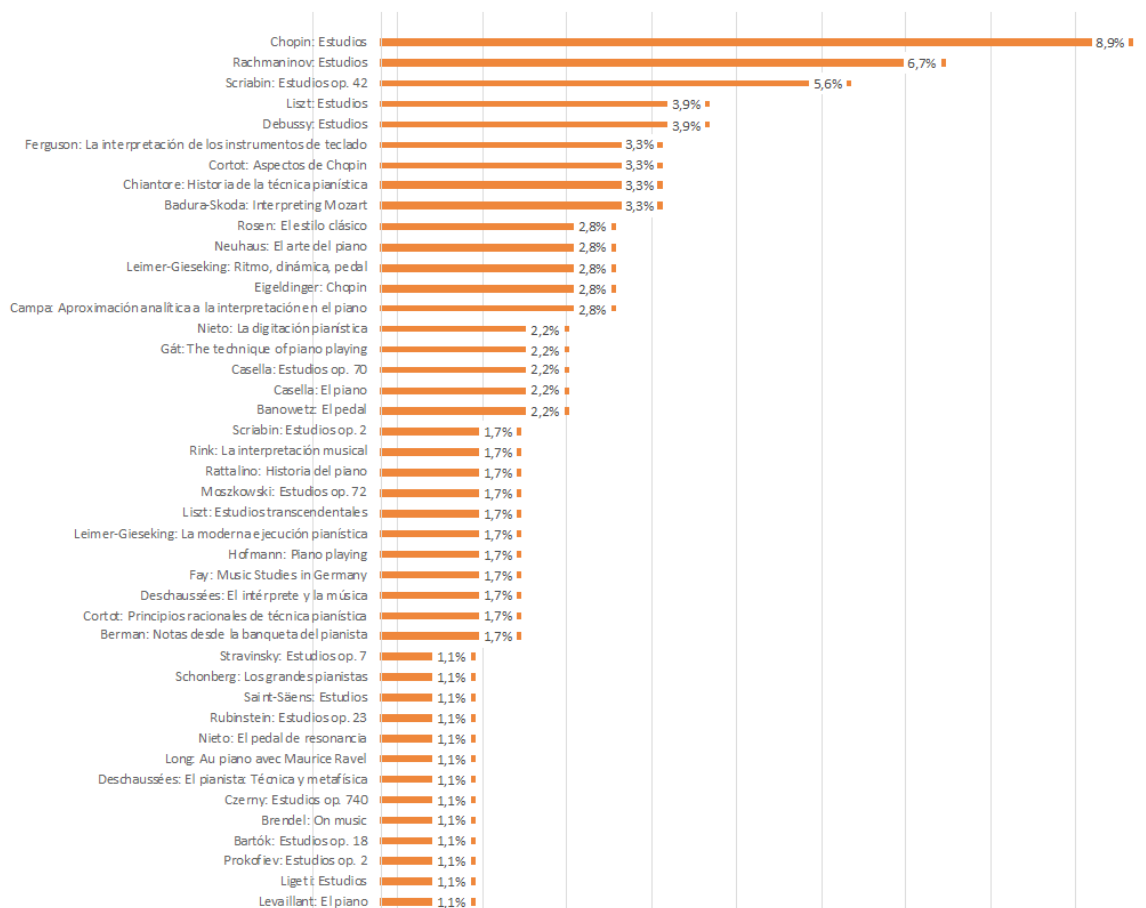


Figure 1. Technical resources recommended in the teaching guides.

## 5. Populations and samples

The study population by means of a questionnaire is made up of all piano students enrolled in Higher Artistic Education in the specialty of Interpretation in all Spanish Higher Conservatories. Once the final version of the questionnaire was prepared using the LimeSurvey online tool<sup>5</sup>, it was distributed electronically using non-probabilistic sampling. By means of a cover letter in which the objectives and purpose of the research were explained, it was chosen to send the link to the corporate email of all the Piano teachers of the Interpretation specialty of the Higher Artistic Education centers. In this way, rigor was guaranteed in the distribution to the target students of the research.

With a participation of 95% of the total of Spanish public centers that impart the selected teachings and 122 complete answers<sup>6</sup>, the sample obtained was accepted considering that it meets the objectives set for the descriptive study of the questionnaire in the research carried out.

## 6. Design and validation of the questionnaire

The questionnaire instrument<sup>7</sup> was developed from the information obtained in two previous studies: a bibliographic review and theoretical documentation on the subject was necessary and an exploratory study was carried out using the technique of discussion groups (Mateo-Laguía, 2021). This strategy intended to reinforce the content validity of the questionnaire (Cohen & Manion, 2002).

Regarding the typology of the questions, open and closed questions were used. Within the latter, dichotomous, multiple-choice, five-point Likert scale questions and Ranking questions were included.

Specifically, the developed questionnaire is made up of a total of 34 questions grouped into 7 dimensions. The first dimension, made up of 12 items, collects the aspects related to the personal and professional profile of the student body, so that it characterizes the sample. The second dimension, made up of 3 items, contains

<sup>5</sup> Available at <https://www.limesurvey.org/es/>

<sup>6</sup> Incomplete answers were eliminated in order to avoid possible bias resulting from incomplete data treatment (Díaz de Rada, 2009).

<sup>7</sup> Available at <https://pianospain.limequery.com/995849?lang=es>

questions related to job expectations and the information received in this regard. The conceptions about the teaching-learning process of the piano technique are compiled in the third dimension, which is made up of two items. The fourth dimension is made up of six items and includes questions related to the study of piano technique, habits and repertoire used for this purpose. The fifth dimension, of five items, contains general aspects of the repertoire. The sixth dimension, made up of four items, contains aspects on the evaluation of the technical aspect. The seventh dimension is made up of two items consisting of open-ended questions where personal opinion can be expressed.

The questionnaire was validated through the expert judgment procedure (Escobar-Pérez & Cuervo-Martínez, 2008). There were four judges participating in the procedure<sup>8</sup>, who were provided with a template with the set of items, paying attention to clarifying their dimensions of belonging, as well as the objective of the test and the indicators to be evaluated. The model of Escobar-Pérez & Cuervo-Martínez (2008) was used, in which four variables are evaluated (sufficiency, clarity, coherence, relevance) with the ranges: 1 (Does not meet the criteria), 2 (Low level), 3 (Moderate level) and 4 (High level). A space was also reserved within the validation instrument to collect the improvement proposals of the judges, in a qualitative way.

Once this procedure was carried out, it was necessary to adjust the instrument in order to improve its validity. For this, the qualitative opinions indicated by the experts were taken into account and the dimensions were reduced, merging items. In this way, the final questionnaire obtained a medium-moderate consensus among experts, with a Kendall's W of 0.524 (Rendón-López & Ortega-Carrillo, 2018) and a high Cronbach's Alpha coefficient of 0.987 (García et al., 2001). It was made up of the following questions, whose base structure is shown in Table 1, related to the Research Objectives:

Table 1. Research objectives related to the questionnaire questions.

OBJECTIVES	QUESTIONS
Know the academic and professional profile of the students surveyed	Gender, Age, Center, Course, Average grade of the previous course, Are you studying another career apart from piano? Which one(s)? Do you currently perform concerts? What type? How many a year? Of the above, is any with a soloist, group and orchestra of international prestige? Do you combine studies with teaching? Have you been informed about future studies or employment in class? What benefits did you get from that experience? How do you see your future in five years? Do you think that we are currently experiencing a methodological change in the way teachers teach?
To know the conceptions that the students have about the piano technique	Indicate the degree of agreement or disagreement regarding the following statements: 1) It is necessary to work on technique through mechanism exercises [five fingers, scales, etc.], 2) Piano technique is a means to be able to make quality music, 3 ) There are specific exercises to work on the pedal, 4) Memory is a technical skill, 5) There are specific exercises to work on piano memory, 6) The Teaching Guide contemplates technical work separately from the concert repertoire, 7) Teachers do not explain how to work on technique in their classes, 8) There is material to work on piano technique, 9) More time should be devoted to sequenced work on technique in piano classes, 10) It should be provided an individualized technical study plan for each male and female student, 11) An assistant teacher should be in charge of teaching the technical aspects, while the main professor is in charge of teaching the concert repertoire, 12) There is no time to work on the technique separately with so much teaching load of theoretical subjects, 13) There is no time to work on the technique with so many works of concert repertoire that are required, 14) Studying many hours is essential to gain technique, 15) Studying slowly is adequate to gain technique, 16) Studying applying rhythmic variants (studying with rhythms) is adequate to gain technique, 17) The curriculum should contemplate more teaching hours for the teaching of the technique, 18) It is essential for future work to acquire a solid piano technique. Rank the following technical resources in order of importance: 1) Chords, 2) Arpeggios, 3) Arm attack, 4) Finger attack, 5) Wrist attack, 6) Weight control, 7) Hand crossing, 8) Scales, 9) Glissandi, 10) Independence, 11) Legato, 12) Memorization, 13) Double notes, 14) Octaves, 15) Pedaling, 16) Jumps, 17) Staccato, 18) Trills, 19) Velocity. Do you do specific exercises to develop any of the following skills? What style of study is most appropriate to work on the technique?

<sup>8</sup> Expert 1 is Professor A. N.: Doctor of Music, pianist, author of six books on piano pedagogy –among them several dedicated to piano technique– and on musical dissemination, as well as a critical edition of Albéniz's Iberia Suite, accompanied by a CD recording, which he has taught piano at various conservatories. Expert 2 is Professor R. L. M.: Doctor of Educational Sciences, repertoire pianist, piano teacher and professor at the Victoria Eugenia Superior Conservatory in Granada for several years. Expert 3 is Professor P. P. J.: researcher, pianist, pedagogue for more than 25 years, professor at the Superior Conservatory of Granada, author and coordinator of different educational innovation projects. Expert 4 is Professor M. A. R.: piano professor with more than 25 years of teaching experience, more than a hundred recitals and recordings with important record labels such as Naxos.



OBJECTIVES	QUESTIONS
Characterize the study of the technique	What resources does your teacher use for the development of piano technique in his classes?: 1) None, 2) He elaborates mechanism solutions adapted to my needs at the moment, 3) He supports himself with methods, treatises, collections of exercises, technical books, etc., 4) Other. Of the studies of the following composers, which ones are you studying or have you studied during Higher Conservatory?: 1) Brahms [exercises], 2) Breithaupt [exercises], 3) Cortot [exercises], 4) Dohnányi [exercises], 5) Hanon [exercises], 6) Kullak, Theodor [exercises], 7) Liszt [exercises], 8) Stamaty [exercises], 9) Brée, Malwine [method and exercises], 10) Granados [pedal method], 11) Chiantore: History of piano technique [essay], 12) Jaël, Marie: Music and psychophysiology [book], 13) Leimer and Giesecking: Rhythm, dynamics, pedal [essay], 14) Leimer: Modern piano performance [essay], 15) Nieto: The resonance pedal [book], 16) Nieto: Piano fingering [essay], 17) Other. Have you played any study of women composers during the Higher Education? Does your teacher use material for the development of technical aspects in their classes? Methods, treatises, collections of mechanism exercises, books on technique, etc. Which one(s)? Do you know of any technical treatise written by a woman? Which one(s)? What kind of repertoire are you studying or have you studied during your Higher Education? Do you detect any deficiency? Which? What would you say has been the most difficult study that you have come to play during the degree? What would you say has been the most difficult piece of concert repertoire that you have managed to play during the Higher Education?
Determine technique evaluation	Do you evaluate your technical progress? What instruments do you use to do so?: 1) Self-observation, 2) Self-assessment rubric of the teaching guide, 3) Test or instructions prepared by my teacher, 4) Test prepared by an organization external to the study center, 5) Other. For the evaluation of the piano subject, which of the following parameters should be taken into account and in what order of importance?: 1) Chords, 2) Arpeggios, 3) Arm attack, 4) Finger attack, 5) Attack wrist, 6) Weight control, 7) Hand crossing, 8) Scales, 9) Glissandi, 10) Independence, 11) Legato, 12) Memorization, 13) Double notes, 14) Octaves, 15) Pedaling, 16) Jumps, 17) Staccato, 18) Trills, 19) Speed. Does your teacher evaluate the technique separately? (studies, scales, specific technical exercises, etc.), What instruments does he or she use for this?
Detect student problems and demands	How would you improve your technique? What do you think your teacher could improve in teaching piano technique?

## 7. Results and discussion

The study sample is made up of 62% of people who identify with the female gender and 38% who identify with the male gender. This is a group of students who obtain good grades –50% have achieved a mark of excellent in the previous academic year– and who are focused on their studies –only 25.4% affirm that they are simultaneously studying another or several degrees–. If these results are compared with previous ones in the context of other study plans, it is observed that the dedication to the career without combining it with others has increased: in Cid (2012), 49% claimed to combine studies.

Regarding job expectations, only 19.7% believe that they will work in something related to music, and most of them believed that they will continue studying while working in the next five years. In fact, only 23.8% report receiving information about future jobs, with women being less informed than men: 32.3% versus 67.7%, finding a significant correlation on this point<sup>9</sup>.

In addition, it is a group that does not play in public: only 25.4% do, observing an increase in frequency as the course increases. Regarding the type of ensemble, women prefer chamber music: 72.2% compared to 27.8% of men.

Regarding the concert activity, it can be claimed that the people who indicate being informed about job opportunities play more in public. It is so because, amongst the participants who are informed about their professional future, 55.2% do not perform concerts compared to 44.8% who do perform in public. However, within the category of people who are not informed, only 19.4% play in public compared to 80.6% who indicate not to perform concerts<sup>10</sup> (Figure 2):

<sup>9</sup> The correlation between the gender variable and the information received about future studies is calculated. Since the typology of variables is nominal and the type of table is 2x2, the Phi square statistic is applied, which is contrasted with Cramer's V and the Contingency Coefficient (Díaz de Rada, 2009). The results show the existence of a correlation between both variables with a significance level of 0.026.

<sup>10</sup> There is a relationship between this variable –information received about job opportunities– and concerts: with a significance level of 0.006, a weak correlation of 0.249 is obtained for the Cramer's Phi and V statistics.

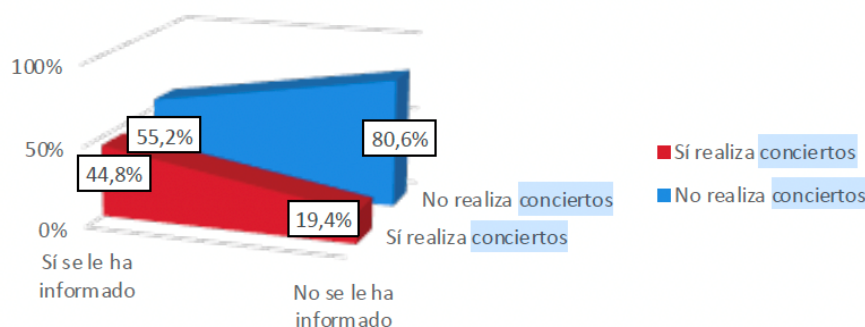


Figure 2. Correlation between perform concerts and the information received about job opportunities.

Regarding the repertoire of studies, this seems to revolve around Chopin, whose studies are played by 96.7% of the student body, complemented by three other authors that around 50% claim to study, which are: Debussy, Rachmaninov and Liszt. The predilection for the Chopinian universe was already pointed out in other similar studies some years ago (Lorenzo, 2009).

Below the above, the student body claims to play the studies of Scriabin (32%) and Schumann (28.8%). Following in descending order of frequency, Prokofiev (23%), Bartók (17.2%), Mendelssohn (15.6%), Ligeti (14.8%) and Moszkowski (13.9%) are found.

These results are in relation to the results of the content analysis of the teaching guides, except in the case of Czerny, which appears referenced in 1.1% of these documents, but whose studies of op. 740 are interpreted by 36.9% of the students.

Therefore, in view of the above, it can be affirmed that the criterion of reproducing a repertoire from the past is the chosen one. In addition, as observed in the composers selected by the student body, it continues to be assigned to the Central European musical canon (Weber, 1999). Hence, 40.2% of the student body points out shortcomings in the repertoire and, within these, the convenience of expanding it to new eras and styles is indicated by 48.6% of the sample.

The mechanism exercise practiced mostly is that of scales, although the item referring to the most important technical skill that should be mastered is answered first by weight control (35.4%), followed by the independence of fingers (19.5%) and scales (13.4%). This implies that the majority of students practice a type of exercise that does not prepare them to undertake the bulk of the repertoire and that contradicts their own beliefs.

Regarding the methodology of the teaching staff, the predominant option for those who teach technique in their classes is to improvise solutions adapted to each technical difficulty presented by the students during the course of the class (54.4%). Only 22.8% of the total sample state that methods or books on technique are used as a resource. Finally, there is 17.1% of students who indicate that they do not receive explanations in this regard.

37.7% of the students state that they do not monitor and self-assess their own technical progress and 84.4% indicate that their teachers do not evaluate their technique. Only 0.8% indicate being examined through a technique exam consisting of scales, arpeggios and other technical elements.

These data show carelessness in the treatment of piano technique and disparity in the criteria followed depending on the school center and the teaching staff, which must be urgently unified, as has already been demonstrated in other aspects of the Higher Musical Education curriculum (Abankwa & Mikkilä, 2018; Báez, 2019; Botella & Isusi-Fagoaga, 2018; Escorihuela, 2017; Gorbunova & Zalivadny, 2018; Hu, 2011; Maugars, 2006).

Together with the bivariate analysis described above, which allowed us to find some statistically significant correlations without forgetting that this procedure finds its limitation in the impossibility of establishing causality relationships, a factorial analysis was applied to question C2, relative to student conceptions of piano technique<sup>11</sup>.

<sup>11</sup> To understand the analysis, it is necessary to know the contents of question C2. This uses a five-point Likert format as a response possibility and is made up of 18 items: Item 1-It is necessary to work on technique through mechanism exercises (five fingers, scales, etc.), Item 2-Pianistic technique is a means to be able to make quality music, Item 3-There are specific exercises to work on the pedal, Item 4-Memory is a technical skill, Item 5-There are specific exercises to work on piano memory, Item 6-The Teaching Guide includes the work on technique separately from the concert repertoire, Item 7- Teachers do not explain how to work on technique in their classes, Item 8-There is material to work on piano technique, Item 9-More time should be devoted to work sequencing of technique in piano lessons, Item 10-An individualized technical study plan should be provided for each male and female student, Item 11- An assistant teacher should be in charge of teaching the technical aspects, while the main professor is in charge of teaching the concert repertoire, Item 12-There is no time to work on the technique separately with so much workload of theoretical subjects, Item 13-There is no time to work on technique with so many concert repertoire works that are required, Item 14-Studying for many hours is essential to gain technique, Item 15-Studying slowly is adequate to gain technique, Item 16-Studying applying rhythmic variants (studying with

This analysis came to reinforce the correlations found previously, through another statistical procedure<sup>12</sup>. As a result, seven factors were obtained, which grouped the variables included in the question in the manner reproduced below in Table 2:

Table 2. Number of factor and items that form it.

FACTOR NUMBER	ITEMS THAT FORM IT
1	Item 11: "An assistant teacher should be in charge of teaching the technical aspects, while the main teacher is in charge of teaching the concert repertoire". Item 14: "Studying many hours is essential to gain technique". Item 15: "Studying slowly is adequate to gain technique". Item 16: "Studying by applying rhythmic variants (studying with rhythms) is adequate to gain technique".
2	Item 12: "There is no time to work on the technique separately with so much teaching load of theoretical subjects". Item 13: "There is no time to work on technique with so many concert repertoire works that are required". Item 17: "The curriculum should contemplate more teaching hours for the teaching of the technique".
3	Item 3: "There are specific exercises to work the pedal". Item 5: "There are specific exercises to work on piano memory". Item 8: "There is material to work on piano technique".
4	Item 2: "The piano technique is a means to be able to make quality music". Item 18: "It is essential for future work to acquire a solid piano technique".
5	Item 4: "Memory is a technical skill". Item 10: "An individualized technical study plan should be provided for each male and female student".
6	Item 7: "Teachers do not explain how to work the technique in their classes". Item 9: "More time should be devoted to sequenced work on technique in piano classes".
7	Item 1: "It is necessary to work on technique through mechanism exercises (five fingers, scales, etc.)". Item 6: "In the Teaching Guide the work of the technique is contemplated separately from the concert repertoire".

In this way, the conceptions of the students about the learning of the piano technique<sup>13</sup> are grouped giving rise to theoretical profiles of approach to the subject, which will be explained below.

The first of these is based on studying at a slow tempo for long periods of time and applying rhythmic variables, under the supervision of an assistant teacher. Studying slowly is a methodology established by Lebert & Stark (1984) and that of rhythmic variables was extended thanks to Hanon (2006).

The second factor focuses on time. The conceptions that form it demand more time to work on the technical aspects and show the need for a reform of the curriculum that allows it. The excessive teaching load of the theoretical subjects and the vast programs required in the piano subject are the prohibitive aspects. The need for an urgent modification of syllabus has been demonstrated for years in other studies similar to this one that contemplate the perspective of teachers (Lorenzo 2009; Escorihuela, 2017) and in those that analyze the Higher Artistic Education curriculum (Baez, 2019; Vicente, 2007). In this study, 66.4% of the students state that they do not have time to work on piano technique due to the excess of theoretical subjects in the curriculum and 61.5% believe that syllabus should be modified to allow more hours to be dedicated to mastery the piano technique.

The third factor is formed by the items related to the existing material to work on the piano technique, both at a general level and for the specific work of memory and the pedal. The percentage of students who claim to know general material is 67.2%, while only a minority know resources for the pedal and memory –43.4% and 33.6%, respectively–.

rhythms) it is adequate to gain technique, Item 17-The curriculum should contemplate more teaching hours for the teaching of the technique, Item 18-It is essential for future work to acquire a solid piano technique.

<sup>12</sup> The factorial analysis could be carried out under favorable conditions, obtaining  $p < 0.001$  in the Bartlett sphericity test and a high value for the Kaiser-Meyer-Olkin measure of 0.776 (Lloret et al., 2014).

<sup>13</sup> Which proved to be valid, with an acceptable result of 0.756 in Cronbach's Alpha for question C2, which brings them together (Frias-Navarro, 2020).



For the fourth factor, the items that refer to the fact that technique is essential for future employment –an opinion subscribed to by 83.6% of the sample– and that it is a means of making quality music –88.4 %– are grouped together. The conception of technique as a means follows the line of other investigations of the environment (Pignatelli, 2016; Bonastre, 2015).

In this study, it is observed that people who ascribe to this factor and get higher scores agree with it<sup>14</sup>. In addition, item 18 correlates with the opinion that teachers should provide an individualized technical study plan<sup>15</sup>, as can be seen in Figure 3:

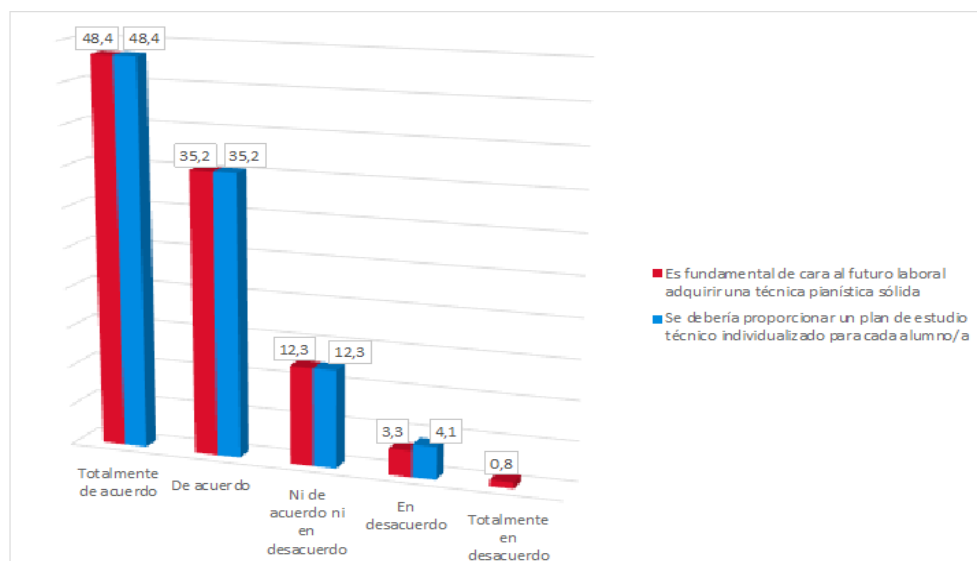


Figure 3. Correlation between “It is essential for the future to acquire a solid piano technique” and “An individualized study plan should be provided”.

The last of the items previously introduced in Figure 3, which reflects that the teaching staff must devise an individualized technical study plan for each student –with which 85.6% of the students agree– is found in the fifth factor, which also includes consideration of memory as a technical element. Therefore, consistent with the demands of the students, this personalized study plan should include the development of piano memory, according to 62.2% of the sample. In addition, it should be done urgently, if it is remembered that only 33.6% claim to know resources for the development of piano memory.

The demand to individualize the didactics of the technique to each specific case has been vindicated during the first half of the 20th century (Golz, 1944) and is one more example of the stagnation that seems to exist in the didactics of the instrument, since it is not possible to detect improvements in this regard at present (Gil, 2010; Woronchak & Comeau, 2016).

The sixth factor shows the need to dedicate more quality time to the teaching-learning process of piano technique, since currently teachers do not pay that attention to it –according to 56% of the total, although 25.4% indicate neither agree nor disagree–.

The seventh factor is a reflection of the nineteenth-century conceptions of the great performers-composers (Brahms, 2009; Liszt, 2006), and of the conservatives of the early and mid-twentieth century (Cortot, 2002a, 2002b; Dohnányi, 1950), who claim that it is necessary to work the technique through exercises of mechanism. In this regard, 63.9% of the students agree. However, only 14.7% believe that this is reflected in the subject teaching guides. Therefore, it is necessary to implement a modification in this regard.

## 8. Conclusions

According to the results of the research carried out, it can be stated first of all, that students rely on texts dating from the 19th century and the first half of the 20th century to learn piano technique. In addition, there is a predominance in the study of the digital technique, being the formula of the scales the most practiced by the student body. Secondly, it is observed that the evaluation of the technical progress is a neglected aspect: 37.7% of students do not pay attention to this aspect and 84.4% of teachers do not evaluate the technique of their students.

<sup>14</sup> Specifically, 0.189 according to Kendall’s Tau-b and 0.209 for Spearman’s Rho between item 18 and the average grade; and 0.267 according to Kendall’s Tau-b and 0.303 for Spearman’s Rho between item 2 and the average grade.

<sup>15</sup> 0.414 is obtained according to Kendall’s Tau-b and 0.450 for Spearman’s Rho.

In this research, it is possible to discern the paradigm about the learning process of the piano technique with the methods used in the institutions of Higher Artistic Education. Chopin etudes are preferred, followed by Rachmaninov and Liszt. However, a notable exception has been found in the case of Czerny: while it is not widely referenced in the teaching guides, students indicate that they play it frequently.

The piano students of the Higher Artistic Education of the Interpretation specialty value the piano technique and demand that it be taught to them. To do this, in his opinion, the way forward is to reduce the load of theoretical subjects in the syllabus and teaching guides and include the technique aspects in the daily practice of teachers through systematic pedagogical instruments adapted to the students.

However, there is a group of people –which are aligned with the sixth and second factors– who do not work on piano technique during their formative years, because they do not have time or because their teacher does not consider it necessary. These practices have been present in teaching since the 19th century (Laor, 2016) and as proven in this research they are still present today.

In this study it has been shown that the questionnaire instrument is valid and admits a good statistical treatment in order to characterize the learning process of the piano technique.

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