# EDUCATION PROGRAMS FOR THE RESTORATION-CONSERVATION OF MUSICAL INSTRUMENTS IN EUROPE – HISTORY AND CURRENT SITUATION

Sebastian Kirsch, Massimiliano Guido, Roland Hentzschel

## Résumé

La restauration d'instruments de musique est une discipline académique qui s'inscrit dans le même cadre déontologique que les autres domaines du patrimoine culturel. Du fait que les instruments de musique sont des objets fonctionnels, la restauration est toujours confrontée au conflit entre la mise en jeu et la conservation.
Les travaux des luthiers ne peuvent souvent pas répondre à ces exigences dans le contexte d'un musée. C'est pourquoi différents programmes de formation spécifique pour les restaurateurs d'instruments de musique ont été mis en place dans le passé. L'article présente les programmes de formation en RDA, en RFA, à Vienne et à Pavie. Alors que les deux premiers programmes n'existent plus, l'université de Pavie et l'académie des Beaux-Arts de Vienne sont actuellement les seuls centres de formation en Europe où l'on peut apprendre à restaurer des instruments de musique au niveau académique.

**Abstract** Since the beginning of museum age, the restoration of musical instruments was strongly connected to their maintenance as functional objects. Therefore, many museums employed or commissioned instrument makers to execute restorations, often with the goal to reactivate an instrument to playing condition. The damages, which are connected to the constant use of functional objects and the inevitable loss of material, led to the need of the integration of musical instruments in the field of modern conservation studies. Since the 1960s, several programs in Europe were designed to train conservators for musical instruments on an academic level. The first program started in the German Democratic Republic (GDR). Later, further programs in Germany, Austria, and Italy were established. Today, only the Academy of Fine Arts in Vienna and at the University of Pavia offer specific programs for the specific study of conservation-restoration of musical instruments in Europe with an integration of the subject in the curriculum. Besides that, other schools support the projects of interested students, often by a cooperation with the conservation workshops of musical instrument collections. This article wants to give an overview of the institutionalised education of conservators for musical instruments and presents the history and the content of four programs without the claim of completeness.

**Resumen** La restauración de instrumentos de música es una disciplina académica que se inscribe en el mismo marco deontológico que en otros campos del patrimonio cultural. Como los instrumentos musicales son objetos funcionales, la restauración siempre se confronta al conflicto entre el uso y la conservación. Generalmente los fabricantes de instrumentos no pueden responder a estas exigencias en contexto de un museo. Por eso diferentes programas de formación específicos para restauradores de instrumentos de música fueron propuestos en el pasado. El artículo presenta los programas de formación en la RDA, la RFA, en Viena y en Pavía. Los dos primeros no existen más; la universidad de Pavía y la Academia de Bellas-Artes de Viena son hoy los únicos centros de formación donde se aprende a restaurar instrumentos de música a nivel académico.

## The education of conservators for musical instruments in the German Democratic Republic

The institutionalizing of the higher education of conservators in the GDR was motivated by the heavy damage and loss of cultural heritage during the Second World War, which highlighted the need for trained specialists in restoration. Thus, from 1956 onwards, the national museum management endeavoured to provide training for young employees and a first concept for the education of a higher education in conservation was drawn. After a second draft in 1963, the curriculum was accepted on 16 May 1966 by the ministry of education. The *Museumstechniker-Musikinstrumenten-Restaurator* (museum's technician – restorer of musical instruments) formed an integral part of the possible specifications in different field of conservation.[1] The training was realised as a distance-learning program with in-house training in several institutions, factories and companies in close cooperation with the Institute for Musicology.

For the political leaders in the GDR, the model of distance learning was of major importance since it offered the opportunity to bring the personal interests of workers into line with those of society. In this way, members of the working class obtained access to academic education and the possibility to even become a university professor. Recruiting academic staff among the workers created favourable conditions for the realisation of the unity of theory and practice through distance learning. Furthermore, the need for academic education could be satisfied without a significant expansion of the capacity of the colleges and technical schools. Workers taking part in the program could remain in the work process for the duration of the distance learning. Because of these features, distance learning had a high educational appeal. It was fully integrated into the GDR's education system with the Law on the Unified Socialist Education System (*Gesetz über das einheitliche sozialistische Bildungssystem*) of 25 February 1965 and with the "Principles for the Education and Further Training of Working People in the Shaping of the Developed Social System of Socialism in the GDR" (*Grundsätzen für die Aus- und Weiterbildung der Werktätigen bei der Gestaltung des entwickelten gesellschaftlichen Systems des Sozialismus in der DDR*) of 16 September 1970.

The need for a regulated and state-recognised training of restorers, especially of musical instruments, was met by the political will for a technical college. Since both the Museum of Musical Instruments and the Museum of Prehistory and Early History in Weimar already had experience with museum-internal training, these two institutions would take the initiative in setting up a distance-learning programme for restorers. Thus, from 1976 onwards, training was offered for the following specialisations: restoration of prehistoric cultural heritage, restoration of musical instruments, restoration of metal objects, restoration of books and cultural heritage made of paper, and restoration on archaeological excavations. For the implementation of the distance-learning programme, a framework curriculum was obligatory for all distance-learning students of a matriculation and specialisation, which specified the study content, number, time and type of performance assessments and exams.

The requirements for the training were the graduation from a polytechnic high school, a certificate of an apprenticeship in a craft concerning the field (i.e. piano maker, organ maker, harmonium maker, wind instrument maker, stringed instrument maker etc.) or *Abtitur*

1 For further reading see Schrammek, 1969; Gernhardt, 1976 and Hellwig, 1984b.

(baccalauréat), several years of practice as craftsman, general aptitude and outstanding musicality

Applicants were required to be delegated to the course by a company. This could be a museum, a musical instrument making company, or an orchestra association. The special nature of the correspondence course for restorers in distance learning meant that it had to be organised at two or three places of study. For the musical instrument restorers, this was the Deutsches Museum Berlin as the place of study for the general part, the Museum für Vorgeschichte Weimar for the subject-specific part and the Musikinstrumentenmuseum Leipzig for the profession-specific part.

After a long period of preparation, the first matriculation with five students started in 1976. The curriculum for musical instrument restoration included the following subjects:

The general part contained Marxism-Leninism, Russian, German, cultural theory/aesthetics, and museology. The subject-related part contained chemistry and material science. Further subjects like casting, moulding, galvano technique and artistic education, technology of conservation and restoration, and documentation and photography took into account the practical requirements of conservation.

Concerning the specific study of musical instruments, the following subjects formed an extensive body of knowledge.

1. History of musical instruments: individual aspects of the entire range of instruments, presentation of the musical instruments in their historical development, precise knowledge of the different types of instruments according to Hornbostel-Sachs, systematics, ensemble formation, introduction to the study of secondary sources.

2. Musical acoustics: oscillation, reflection and standing wave, structure and function of the acoustic receptor, acoustics of musical instruments, introduction to room acoustics, history of acoustics and timbre, tone systems and tuning.

3. Basics of musical instrument making: wood joints, carving, turning, veneering, inlays, sanding, staining, polishing.

4. Specialisation, e.g. on keyboard instruments (also existed for the other instrument groups, e.g. organ instruments): general organology, detailed organology, study of primary sources, empirical and constructive design.

5. Practical music exercises: basic knowledge of music theory and form, introduction in historically informed performance practice, music lessons and evaluation of contemporary music literature.

To complete the program within the four years of training and one final work, the following time frame was proposed as a guideline: 514 hours of self-study plus 222 hours of consultation for the general and the subject-related part (common study subjects), 844 hours of self-study plus 594 hours of consultation for the specialisation.

For the general part, teachers from other colleges and universities in Berlin were invited, e.g. the teachers for the subject Marxism-Leninism from the Humboldt University in Berlin.

The teachers for the subject-related part of the course were either employed in museums or worked as freelancers, who were hired on a fee basis. Concerning the teachers, who were employed as research assistants at the Leipzig Museum of Musical Instruments, they usually taught similar subjects in the musicology department of the University of Leipzig and adapted their syllabus for the restoration training.

Through the numerous consultations of instruments by a large group of students, a strong link of the program to Leipzig Museum of Musical Instruments was established. The instruments were used for instrumental training. Practical restoration work on objects from this museum by external students was not foreseen. Each student worked on the objects assigned to them in the companies that delegated them, which was the only possible solution due to the nature of the course as a distance learning training program. Only the trainees employed at the Leipzig Museum of Musical Instruments worked on the museum's objects.

At the beginning, the approach of the restoration program and the expectations to the restorer were very close to the ideas of the collector Wilhelm Heyer, from whom the University of Leipzig purchased the collection in 1929. His idea of building up and extending the collection of the previous owner Paul de Wit was not to merely collect, but to use the instruments and to put unusable instruments back into playing condition. "Highest goal is the playability of selected instruments for concerts, presentations and archive recordings. Every musical use requires difficult special works in advance, which often take weeks or several months." (Schrammek, 1976, p. 13) Since the collection was purchased by the university, the institute of musicology used the objects in their practical teaching of organology. The practical exercise was a crucial part of the educational concept (Fontana, 2010). In the 1970s the Collegium musicum and the Capella Fidicina, a specialized ensemble for early music founded by Hans Grüß, had regular performances in the museum. At that time also organological research was published and the institute was seeking for international exchange. Restoration, performance practice, and organological research were strongly connected.

Over the entire period of the program in the GDR, 24 restorers completed the two training models. In the 18 years of the technical college correspondence course with four matriculates, there were 19 diploma holders. In addition, a few interested externals took part in the training as guest students and did not obtain a diploma.

In the course of the political changes after 1989, the education system of the former GDR was fundamentally called into question. While the universities and colleges generally continued to exist, some of the distance learning institutions, which were not practised in this form in the Federal Republic, were discontinued. The attempt to continue the distance learning course in restoration at the Berlin University of Applied Sciences was only possible in the form of a conversion into a regular course of study. The possibility of completing a Master's degree remained as a rudiment.

The distance learning program for conservators offered students the opportunity to continue their education while working. It demanded a high level of discipline and commitment from the students. In retrospect, this form of education was able to make a significant contribution to raising the profile of the restoration profession if these two prerequisites were met.

## The training of conservators for musical instruments at the Germanisches Nationalmuseum, Nuermberg

In the German Federal Republic (West Germany), the academic education of restorers and conservators had no formal frame for a long time. Three professional associations grouping the technical staff in museums and freelance restorers (*Arbeitsgemeinschaft des Technischen Museumspersonals, Deutscher Restauratorenverband, Deutscher Verband Freiberuflicher Restauratoren*) published a common statement in 1981 describing the need and the specific possible

realisation of an academic training in restoration of cultural heritage. The application of scientific methods to the practice of conservation and restoration was not compatible with the programs on the several technical universities and polytechnical colleges (*Fachhochschulen*) and no legally recognised study program existed. The education of restorers at the Germanisches Nationalmuseum was eventually institutionalised in 1984 in order to create a structured program in conservation and restoration with the opportunity of a university degree. It was designed as a combination of practical and scientific education at the museum with additional courses at the university.[2]

Therefore, the *Abitur* (baccalauréat) was required to enter the program the Germanisches Nationalmuseum. On the one hand, it qualified to understand the scientific and cultural historical context in conservation, but also to participate in courses at the university in art history, archaeology, musicology, and similar studies. The goal was to enable the student to receive student funding and to participate in university studies to complete the subjects of the program and eventually to receive an official academic degree. Furthermore, previous technical knowledge was demanded depending on the specification. For example, for textile restoration, an apprenticeship as hand weaver or for the restoration of paintings and sculptures, a training as church painter were required. Any artistic apprenticeship or 2-year internship in restoration, or an artistic and scientific study was accepted as entry qualification.

Other abilities, for example naturalistic drawing, and in case of musical instruments, musical skills and the play of an instrument were required. The program started with a trial period of three months and was laid out for four years. Like in the technical universities and polytechnical colleges, the third year was planned to be an obligatory internship in different institution. At the beginning of the program, five subjects were offered: restoration of paintings and sculptures, textiles, musical instruments, furniture, and archaeological objects (including arts and crafts). Paper and book restoration was still in preparation.

In order to complete the education, the students had to prove their skills in a final project with a large documentation of a restoration or a major work concerning the history and technology of art works or historic materials. The goal of the education was to form practice-oriented conservators with a background in art and natural sciences as well as arts. The vision for a professional perspective for the students was on the one hand the employment in a museum but also driven by the hope that more positions in public service and institutions will be created for qualified specialists as well as by the idea of a growing market in the private sector for freelance restorers (Brachert, Hellwig, 1984, p. 44).

The program was structured in three parts (Brachert, Hellwig, 1984, p. 44-52). The first part concerned the studies at the university and was depending on the specialization. Students were taking part in courses in art history, musicology, archaeology and prehistory and had to proof their records by certificates of the university.

The second part concerned general basics of conservation and restoration. It was concerning students of all specialisation and contained technical and scientific topics as scientific methods (organic and inorganic chemistry, physics, biology, microscopy), material sciences (historic and modern materials and their properties for the creation of artworks), museum technology (climate conditions, light, presentation, biological risks, environmental risks, packaging and transport, mounting). Furthermore, artistic education and documentation was

2 All information on the section taken from Brachert, Hellwig 1984.

covered by the subjects nature drawing (basics of realistic drawing), photography (basics in black- and white and colour photography, UV and infrared-photography, X-ray examination) and documentation (standards of documentation in museums and context of cultural heritage, description of restauration processes using drawings, photography, photogrammetry, maps, and technical drawings). Finally, specific legal studies concerning the conventions of preservation, and the basics of relevant legal provisions in the context of cultural heritage conservation in a national and international framework completed the general training.

The content of the third part was depending on the specialisation. For the restoration of musical instruments, this was the thorough study of materials, technology and the restoration of musical instruments of all kinds. Further specific knowledge concerned the history of music, the use of musical instruments, acoustics and principles of the generation of sound. A central focus was on the historic and modern materials for the production of musical instruments, their construction and technology and on the practical craft skills to reproduce historic instruments. Exercises in casting and moulding completed the documentation and specific restoration methods of musical instruments. The technical knowledge on conservation and restoration was also including the necessary methods to put instruments in playing condition.

The training of conservators for musical instruments was strongly connected to the activities of Friedmann Hellwig, who was the driving force of the implementation of the program at the Germanisches Nationalmuseum. He discussed the situation that still a lot of instrument makers were employed in museums as restorers as an inherent problem (Hellwig, 1984a). Craftsmen would remain bound up in their perspective often with the result of a maximum amount of playable instrument. Hellwig emphasised that playability is not automatically the goal of a restoration, stressing also the fact that replications could take the place, while restoration would imply first of all the material conservation of the objects. In Hellwig's perspective, a restorer has to be a conservator with thorough knowledge on the construction and technology of musical instruments, organology, musical knowledge, artistic sensibility, and a scientific interest. Non-Western instruments were explicitly included in this approach of combining manual talent with intellectual ability.

## Conservation-restoration of musical instruments at the Academy of Fine Arts Vienna

In 1837, the first considerations to install a course for restoration at the Academy of Fine Arts Vienna were made but it took until 1902 when another attempt to install the courses was successful. Only three students per year were accepted to receive an education of three years.[3]

From 1917 on, regular restoration courses were held and since 1925 the training was implemented in the regulations of the academy. With the official founding of the Technical School for Conservation and Technology (*Fachschule für Konservierung und Technologie*), the program received the status of a *Meisterschule* (masterclass), which corresponds to the chair of a university. From this moment on, conservators were treated like other academics.

In general, all applicants needed to have higher school degree or an apprenticeship diploma in a specific craft. Due to the status of the academy as a school of fine arts, artistic skills had to be proven by a portfolio of drawings, paintings, photos, or sculptures. After the successful

3 This section is a reduced version of Kirsch, 2018; see also Kortan, 1973 and Kortan, 1984.

exam of the portfolio, an entrance exam of several days followed. The principles of the process of the admission procedure has not changed until today.

The program was and still is designed for ten semesters including two semesters trial period. At the beginning, a general introduction in techniques of painting and gilding as well as several copies of paintings and prints were required during the first year, accompanied by courses in figure drawing.

In 1972 Peter Kukela, suggested a curriculum for the restoration of musical instruments. Kukelka was working from 1965-1971 as conservator in the collection of old musical instrument (*Sammlung alter Musikinstrumente*) of the Kunsthistorisches Museum and evoked the idea to lift the conservation and restoration of musical instruments on an academic level. In winter 1972, the first curriculum for musical instrument started and Kukelka took over the teaching assignment.

Kukelka's understanding of historical musical instruments and thus also the teaching content were strongly influenced by the spirit of Josef Mertin, who can be counted among the founders of the early music movement in Austria. Mertin's approach was to analyse the technical requirements of musical instruments in order to trace the sound of past times. His constant search for the correct instruments for early music was based on the conviction that a musical experience is necessary in order to recognise the connections between music, material and the principles of composition. These were guiding principles for an entire generation, which includes among others Nikolaus Harnoncourt and René Clemencic.

While students followed all preparation and theoretical courses with the students of the other specifications, the practical training for the restoration of musical instruments took place in Kukelka's private workshop. In order to learn the basic craft skills, every student had to build a clavichord without the help of electric machines. For the actual conservation work, the students treated objects from the collection of the Gesellschaft der Musikfreunde and other museums in Austria. The practical education was extended by theoretical courses on different topics concerning the history of music and acoustics in other institution such as the Wiener Musikverein and the conservatory.

The structural reform of the academy in 1983 resulted in a discontinuation of Kukelka's teaching assignment. It was one of his students and his successor as conservator at the Kunsthistorisches Museum, Alfons Huber, who proposed in 1997 to re-establish the curriculum, which has been continued since then. During a further reform of the curriculum in 2003, the specification on the restoration of musical instruments was integrated as a constitutional part in the study focus "wooden objects".

The current curriculum has adapted to the development of the field towards a stronger orientation towards science compared to the more artistic approaches of the past. The goal is an education based on scientific research and the combination of theory and practice. A central part is the understanding of the singularity of cultural heritage in its artistic, scientific, intellectual, and spiritual dimensions. The aspired qualifications are tightly bound to the concepts described in the document of Pavia, the ENCoRE best practices for restoration education at University level (2001 and 2014).[4]

4 The Document of Pavia. Preservation of Cultural Heritage: Towards a European profile of the conservator-restorer, European summit, Pavia 18–22 October 1997, Associazione Giovanni Secco Suardo, Lurano, http://www.encore-edu.org/Pavia.html?tabindex=1&tabid=188 [accessed 20.02.2023]; Clarification of Conservation/

The study is structured in two parts.[5] The first part includes 32 weekly hours (32 ECTS) in conservation-restoration, 8 hours (8 ECTS) in cultural science (art history, philosophy), 12 weekly hours (18 ECTS) in chemistry including chemical laboratory practice, and 2 weekly hours (2 ECTS) in figure drawing. The courses in the second part are more focused on the different specifications. For practical conservation-restoration, 112 weekly hours (112 ECTS) have to be completed, 8 weekly hours (8ECTS) in art history, and 11 weekly hours (13 ECTS) in methods of conservation science including surface cleaning, photography, law and business management, preventive conservation and climate, scientific research and writing, as well as theory, history and methodology of cultural heritage studies. A strong focus is on scientific methods with 24 weekly hours (28 ECTS). This contains organic and inorganic chemistry, chemistry of solvents, examination methods, microbiology, and more. These general studies are completed by 22 weekly hours (22 ECTS) concerning the respective specialisation, 400 hours of internships during the holidays, and 11 ECTS by choosing optional additional subjects.

Concerning the specialisation on wooden objects (including musical instruments) the specific studies contain, among other subjects, the history of technology of musical instruments, study of historical sources, recent problems in restoration and conservation, the study of complex materials, treatment of wooden surfaces, structure and properties of wood, and methods of digital documentation. The specific courses on the restoration of musical instruments give an overview of the technology of musical instrument making. They include basics in organology, acoustics, and the aesthetic principles of the construction of musical instruments. A strong focus is on the technological constraints concerning the material and its properties. Thus, the methodology concerning the analysis of damages and possible restorations is characterised by a thorough understanding of the material and technological characteristics concerning the functional aspects of the instruments.

The practical education in conservation-restoration for musical instruments takes place in the workshop of the *Sammlung alter Musikinstrumente* at the Kunsthistorisches Museum. Since the retirement of Alfons Huber, his successor Ina Hoheisel took over the teaching assignment. Students work from beginning on with the objects of the collection of the museum. Being integrated in the team of the museum, students can take advantage of the intellectual atmosphere, are able to exchange with the curators and other conservators of different fields, and have access to a certain level to the extensive resources of the Kunsthistorisches Museum concerning for example material analysis. The program is completed with a comprehensive diploma thesis, which often contains next to the execution and documentation of the restoration and conservation of an instrument an organolocical analysis of high quality (see e.g. Rath, 2018).

Restoration Education at University Level or Recognised Equivalent, ENCoRE (European Network for Conservation-Restoration Education), 3rd General Assembly, Munich, 19–22.6.2001 http://www.encore-edu.org/ENCoRE-documents/cp.pdf [20.02.2023]; On practice in Conservation-Restoration Education – ENCoRE 2014, http://www.encore-edu.org/ENCoRE-documents/PracticePaper2014.pdf [accessed 20.02.2023].

**5** See the curriculum online https://www.akbild.ac.at/de/studium/studienrichtungen/konservierung-und-restaurierung/studienplan-konservierung-restaurierung-2021-1.pdf [accessed 20.02.2023].

## Restoration and conservation of musical instruments at the University of Pavia

In 2004, the Italian Parliament approved the so-called Codex of Cultural Heritage (D.L. n. 42, 22/01/2004).[6] Among other important innovations, it was decided to create specific lists of restorers who could operate on listed objects, divided according to materials and typology of artifact. The restorers who could prove a continuous experience (before June 2015) were evaluated and added to these lists. The ones specialized in musical instruments numbered slightly over one hundred, with an impressive majority of organ builders, two violinmakers, and one expert in historical pianos. A conservative approach with a strong background in science and theory of restoration, together with a long tradition of teaching were already well established in the field of cultural heritage, while the prevailing attitude for musical instruments was clearly oriented to functionality and based on workshop experience.

From then on, the only way to become a restorer of listed instruments and being added to the directory is to follow a five-year program at university level, specializing in the sixth and last study track (PFP6).[7] The Musicology and Cultural Heritage Department of the University of Pavia is the only Higher Education Institution in Italy to offer such a qualification. The course was opened in Cremona in 2016, thanks to the support of a local network of stakeholders, which include the City of Cremona, the *Museo del Violino*, the International School of Violin Making, and the centre for professional education *CRForma*.[8]

The program is run by the University of Pavia with the support of the *Politecnico* of Milan for courses in musical acoustics. Several departments are involved, covering a broad spectrum of disciplines.[9] Three main components constitute the core of the program: scientific subjects related to restoration; humanistic disciplines focused on music, art, and history of science and conservation theory; conservation and restoration workshops. The students must take 2,500 hours of practical workshops over five years, organised according to typology of artefact: bowed instruments, plucked instruments, organ, keyboard, aerophones, and scientific tools. The actual legislation does not permit a specific focus, being the qualification valid to operate on all musical instruments and scientific tools. The title is earned after completion of all the exams, a practical restoration of a listed artefact, and the written master thesis, defended in front of a commission including representatives of the Ministry of Education and the Ministry of Culture.

6 https://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2004-01-22;42 [accessed 14/01/2023]

7 For musical instruments one has to select Sector 11 and search the online database at https://professionisti.beniculturali.it/restauratori [accessed 14/01/2023]. In theory, three different study tracks coexist: the diploma from the Ministry of Culture Schools of High Specialization; the Master's Degree in Conservation and Restoration offered from some universities; and an equivalent diploma offered by the academies of fine arts. For a detailed explanation see https://dger.beniculturali.it/professioni/restauratori-di-beni-culturali [accessed 14/01/2023].

8 The latter offers also a specific course for technicians of restoration, an assistant-like figure, also regimented by the Codex of Cultural Heritage. In this case, the legislator has left to each Region the freedom to organise the education pattern, focusing on practical activities. Furthermore, the national list of qualified operators is not divided into specific specialties (see https://professionisti.beniculturali.it/tecnici [accessed 14/01/2023]).

9 For the detailed studio manifesto see https://restauro.cdl.unipv.it/it/studiare/piano-degli-studi [accessed 14/01/2023].

Only five students per year are selected, because the law has a strict ratio of one workshop professor for five students. At full capacity, the program hosts about 25 students coming from all Italy and abroad.

The teachers are selected among the professionals who have a track record in restoration of listed instruments, having worked with museums in Italy and Europe. Some international teachers have been involved during the years (Grant O'Brien, Thomas Wilder, Andrew Dipper, Kerstin Schwarz).

The university has negotiated several agreements with museums to provide instruments and traineeship occasions.

The students who graduate will be eligible for working as conservators in museums and the only permitted to restore the instruments in public collections. A doctoral program for further specialisation in specific instruments is under discussion.

## Conclusion

The need for an education in conservation-restoration of musical instruments on an academic level in different periods resulted in various programs of which only two are currently running. Many of the conservators, who are specialised in musical instruments, enriched their knowledge in addition to their studies through internships and acquired techniques by teachers active in different disciplines. This interdisciplinary exchange of several fields in restoration, with instrument makers, acousticians, and other sciences is a necessary feature of this education and can be found as core element in all syllabi from the beginning on.

As in other disciplines, the restoration of musical instruments in the field of cultural heritage must be distinguished from the activities of craftsmen without specific training in conservation. The working techniques, materials, examination methods and documentation techniques, but above all the intellectual background can only be transmitted through specific studies. The demand for restorers of musical instruments in public institutions is still low. Nevertheless, the history of the various programs shows the necessity of restoration in the sense of cultural heritage against the background of different and always current perspectives: war destruction, demand for playability in connection with historically informed performance practice, new museum concepts and much more. Musical instruments will always be subject to the demand for playability, which is why this aspect, along with all other conservational aspects, must be reconsidered in every period and with all available methods. A good place to hold these discussions are the universities, which are shaping the training of conservators and thus the future of the discipline.

## Références bibliographiques

**Brachert T., Hellwig F.** (1984), « Restauratorenausbildung am Institut für Kunsttechnik und Konservierung am Germanischen Nationalmuseum Nürnberg », dans Anker, D., Wihr, R. (ed.), *Arbeitsblätter für Restauratoren, Die Ausbildung von Restauratoren an öffentlichen Institutionen der Bunderepublik Deutschland* (*Beiheft 1984*), p. 41-52

**Gernhardt K.**(1976), « Über die Faschulausbildung von Musikinstrumentenrestauratoren », dans *Schriftenreihe des Musikinstrumentenmuseums der Karl-Marx-Universität. Heft 3.* (*Aufsätze und Jahresbericht 1976*), p. 17-22

**Fontana E.** (2010.), « Annäherungen an die Alte Musik: Leipziger Protagonisten einer 'Bewegung' », dans Fontana, E. (ed.), *600 Jahre Musik an der Universität Leipzig*, Wettin, Dößel, Stekovics, p. 327-336.

**Hellwig F.** (1984a), « Der Restaurator für Musikinstrumente », dans *Arbeitsblätter für Restauratoren, Die Ausbildung von Restauratoren an öffentlichen Institutionen der Bunderepublik Deutschland* (*Beiheft 1984*), p. 65-72

**Hellwig F.** (1984b), « Die Ausbildung von Restauratoren in der Deutschen Demokratischen Republik », dans *Arbeitsblätter für Restauratoren, Die Ausbildung von Restauratoren an öffentlichen Institutionen der Bunderepublik Deutschland* (*Beiheft 1984*), p. 41-43

**Kirsch S.** (2018), « Die Sammlung alter Musikinstrumente als Ausbildungsstatte », dans Darmstadter, B., Hopfner, R., Huber, A. (ed.), *Die Sammlung Alter Musikinstrumente – Die ersten hundert Jahre*, Vienne, KHM, p. 329-340

**Kortan H.** (1973), « Zur Ausbildung des Restaurators », dans *Berufsvereinigung der bildenden Künstler Österreichs, Rettung von Kunstwerken*, p. 29-34

**Kortan H.** (1981), « Die Meisterschule für Konservierung und Technologie an der Akademie der bildenden Künste in Wien », dans *Der Restaurator Heute. Beiträge zur Definition eines Berufes. Zum 25-jährigen Bestehen der Arbeitsgemeinschaft des technischen Museumspersonals*, Trier, Arbeitsgemeinschaft des technischen Museumspersonals, p. 37-40

**Kortan H.** (1984), « Die Meisterschule für Konservierung und Technologie an der Akademie der bildenden Künste in Wien und ihre Vorläufer seit Metternich », *Österreichische Sektion des IIC, Restauratorenblätter, Restauratorenausbildung an der Akademie der bildenden Künste in Wien*, N° 7, p. 35–41

**Rath J.**, (2018) *Examination, conservation, restauration and reconstruction of the oldest known Viennese double bass made by Nikolaus Leidolff, 1693,* (KHM Wien, *Sammlung alter Musikinstrumente*, SAM 909), 331 p. Disponible sur: https://www.hornemann-institut.de/de/epubl_ha_ausgabe.php?lang=&haid=3023&l=u&sw=Musikinstrumente&ref=/de/epubl_suche.php [accessed 20/02/2023].

**Schrammek W.** (1969), « Die Ausbildung von Musikinstrumenten-Restauratoren im Musikinstrumenten-Museum in der Karl-Marx-Universität Leipzig », *Neue Museumskunde*, N° 12, p. 98–105.

**Schrammek W.** (1976), *Museum Musicum. Fotos S. und V. Herre*. Leipzig, Edition Peters.

## Les auteurs

**Sebastian Kirsch** est conservateur-restaurateur au musée de la Musique à Paris. À partir de l'été 2023, il sera *visting assistance professor* au Colorado College, Colorado Springs (USA). Il est spécialisé dans l'imagerie 3D et la tomographie 3D. Il est titulaire d'un doctorat en Musicologie (université de Leipzig et Royal College of Music, Londres). Sa recherche se concentre sur l'histoire culturelle et matérielle des instruments à cordes en Europe, en particulier le luth. sebastian.kirsch@posteo.de

**Massimiliano Guido** est conservateur de la collection d'instruments de musique à l'université de Pavie et professeur associé au département de Musicologie et de patrimoine culturel, où il enseigne l'Histoire des instruments de musique et l'iconographie musicale. Il est le doyen du programme de master en Conservation et restauration des instruments de musique. Il s'intéresse plus particulièrement aux claviers historiques et à leur lien avec la théorie et la pratique musicales. massimiliano.guido@unipv.it

**Roland Hentzschel** Conservateur-restaurateur. Il a suivi une formation de facteur d'orgues et a travaillé dans ce métier jusqu'en 1988. Il a ensuite étudié dans l'École supérieure de la RDA pour devenir restaurateur d'instruments de musique à Berlin et à Leipzig. Depuis 1988, il travaille dans l'atelier de restauration du Händel-Haus Halle et est chef d'équipe depuis 1991. En 2008, il a passé l'examen d'expert en orgues et, depuis 2012, il enseigne la théorie de l'orgue à la Haute École de musique sacrée évangélique de Halle. En plus de son activité à la Händel-Haus, il conseille les musées les plus divers sur les questions relatives aux instruments de musique et élabore des concepts de restauration et des expertises. roland.hentzschel@haendelhaus.de