


Article

The Vocational School of Sintra and Its Contribution to Heritage Education

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Abstract: This paper aims to share the experience acquired with students of the 3rd year (namely the 12th grade of the Portuguese educational system) at the Vocational School for the Recovery of Heritage of Sintra in the Course of Studies for Conservation and Restoration Assistants in the field of Plaster Restoration, in the classes of Work-Related Training and Analytical Methods of Examination and Laboratory Analysis, by carrying out theoretical-practical work and training in a work context specifically focused on Portuguese heritage, demonstrating how practical classes motivate students and prepare them for future professional work. This vocational course helps students to reflect and question themselves on the role of “looking” at heritage. Thus, its cross information, both interdisciplinary and from the historical-artistic context of the monument, will provide a better perspective over its materiality and its use. In situ learning awakens students to the reality of work. The notion that they are helping to maintain the memory of ancestors credits them and gives them confidence in their work. After presenting their Final Year Projects, they look at heritage with a more awakened vision. With this, they have the perception that they have contributed to the reconstruction of memory, their cultural heritage.



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1. Introduction

1.1. Vocational and Professional Teaching in Portugal

The idea of vocational teaching in Portugal emerged in the post-World War II era, with the creation of our technical and professional education in 1948, established by Decree-Law no. 31431 of 29 November 1941 [1] (pp. 46, 55). This reform increased the curricular component, maintaining the existing workshop from the beginning of the Estado Novo (“New State”), with the implementation of compulsory general education in 1926.

The assistance provided by the Marshall Plan required industrial renovation, reviving industrial education and launching a new two-year technical education framework, with professional guidance [1] (p. 51). However, Portugal witnessed a decrease of student enrollment in technical education during the decades between 1950 and 1979. (Table 1)

Table 1. Student enrollment in technical education between the 1950s and 1970s, in Portugal [1] (p. 63).

	Years		
	1951	1961	1970s
Students enrolled in technical education	11%	3.5%	1%

The Reform of Veiga Simão (born 1929–died 2014) in the 1970s (between 1970 and 1974), brought an increase in the demand for specialized technical professionals [1] (p. 74).

However, in 1971, Veiga Simão sought to “democratize education”, make it diversified, equitable, inter-relational and individualized ([2] (p. 10), [3] (p. 2)). This goal is being developed again by the Ministry of Education regarding the implementation of the Student Profile at a national level, continuing the work of more than four decades of educational development in Portugal.

In the 1980s, only 2% (7239, out of a total of 314120) of the students enrolled in complementary education were in the vocational area [1] (p. 124). The Basic Law of the Education System of 1986, through Law 46/86 of October 14th, initiated the long struggle for vocational education, as a solution for the urgent need to produce specialized technicians adapted to the national and regional cyclical needs [1] (p. 125/126).

In 1987, Joaquim de Azevedo, a member of the Education System Reform Commission (CRSE) identified 18 professional areas, distributed over five different levels, according to the Council of the European Communities (DCCE of 1985):

- Levels I and II: basic education (9th grade);
- Level III: secondary school education (10th, 11th and 12th years);
- Levels IV and V: post-secondary higher education (polytechnic and university education).

At that time, Joaquim Azevedo defended the importance of educational and training, developing the student’s social profile, as well as independence and lifelong training, promoting individual and group work habits, and also the incentive towards an active life—topics that are still deeply debated and present in the laws and pedagogical guidelines [4] (p. 78).

In order to combat the reduced number of students opting for vocational studies, Vocational Schools in Portugal were officially established in 1989, through Decree-Law 26/89, of 21 January. This decree aimed to modernize Portuguese education, creating a network of vocational schools, articulated with the various departments of the State, as was already implemented around the world, taking into consideration United Nations Educational, Scientific and Cultural Organization’s guidelines [5] (p. 250). Finally, this decree also indicated that the objectives and curriculum of vocational courses meet the standards adopted by the European Community in terms of professional qualification.

As early as the academic year 1988/1989, there was an increase of 19947 students enrolled in technical-professional and vocational courses, with the program Techniques for the Reconstruction of Built Heritage falling into the first group (source: ME/GETAP).

The great innovation brought in by Decree-Law 26/89, of 21 January, was the possibility of completing the 12th grade with a training equivalent. Therefore, only in 2012 was Decree-Law 176/2012 of 2 August enacted, for compulsory education up to the 12th grade or the age of 18.

1.2. School History and Its Location

The Vocational School of Heritage Recovery of Sintra (EPRPS—Escola Profissional de Recuperação do Património de Sintra) was founded in 1991, although it has been in operation since 1989, following the decision of Decree-Law No. 26/89 of 21 January. This decree aimed to create vocational schools of non-higher education, to compensate for the disappearance of technical/industrial education, whose social pressure culminated in the need to train qualified professionals in specific areas.

In the beginning, EPRPS only offered the technical course for Technicians in the Recovery of Built Heritage, through Ordinance No. 207/92 of 19 March (1992), with the following curriculum (Table 2).

In this program, students developed critical thinking, reflection on values, ideas, methodologies, projects and proposals, with the ultimate goal always being the preservation of national heritage, as the country’s memory and history.

In 2004, EPRPS moved to Odrinhas, Parish of São João das Lampas, Odrinhas, in the municipality of Sintra, district of Lisbon. Considering the geographic location of the Lisbon district, we realise that the school is now at a distance of 27 kilometres compared to its initial location in Cacém.

Table 2. Initial school curriculum for the Technicians in the Recovery of Built Heritage course program.

			Annual Hours			Total Disc.
			1° (10°)	2° (11°)	3° (12°)	
Training components	Sociocultural	Portuguese	100	100	100	300
		Foreign Language	100	100	100	300
		Integration Area	100	100	100	300
	Scientific	Art History	120	120	120	360
		Physics/Chemistry	100	100	-	200
		Mathematics (Geometry)	100	-	-	100
		Descriptive Geometry	-	120	120	240
	Technological Techniques and Practice	Theory and Ethics of Built Heritage Recovery	80	40	40	160
		Drawing	100	70	70	240
		Technology and Material Behaviour	-	70	70	140
	Auxiliary Techniques for Heritage Recovery	80	60	80	220	
	Practical Classes	320	360	400	1080	
Total Hours Year/Course			1200	1240	1200	3640

Thus, it can be accessed via one of the district's main roads, the IC19, but the fastest access is via the A16 and following the N247. In terms of public transport, the Mafrense bus line offers hourly service from Portela de Sintra (Station) to Ericeira, and the school contains two stops: Barreira to the north of the school and Odrinhas to the south (Figure 1).

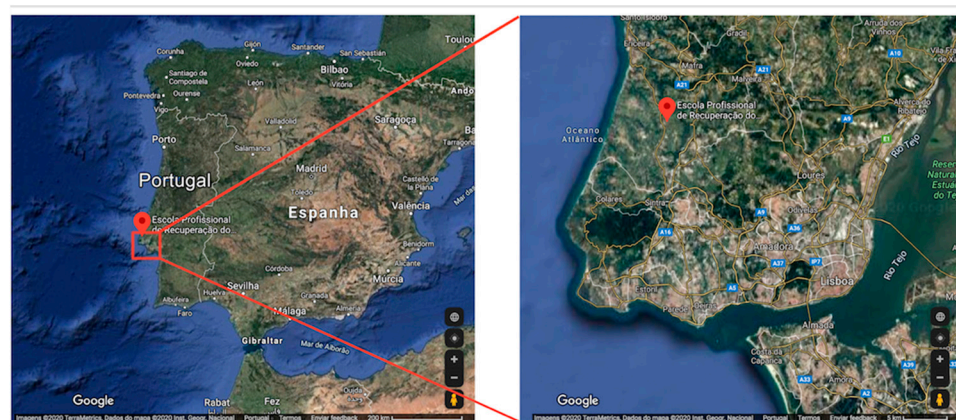


Figure 1. General view of the Lisbon District and detailed view of Odrinhas from @GoogleMaps, with signposts of the route to Escola Profissional de Recuperação do Património de Sintra (EPRPS). [Retrieved 10 October 2019].

In the parish of São João das Lampas, in terms of heritage, there is the Archaeological Museum of São Miguel de Odrinhas, created in 1955, and built around the Chapel of São Miguel. EPRPS has its own space built from scratch, but also with the support of Museu Arqueológico de São Miguel de Odrinhas which allows it to use its auditorium for Integration classes on Mondays, when the museum is closed (Figure 2).

In a rural environment and considering the architectural context of the buildings of the Archaeological Museum of São Miguel de Odrinhas, the school was built with the same typology, maintaining the blue band on the facades (Figure 3).

The building was built with the pedagogical project in mind, and this is evident in terms of architecture in the construction of workshops facing an interior courtyard, such as Arab architecture (Figure 4). This patio combines the areas of metal, wood, stucco, mural painting, tiles and stonework. It is also through this patio that the school cafeteria can be accessed.

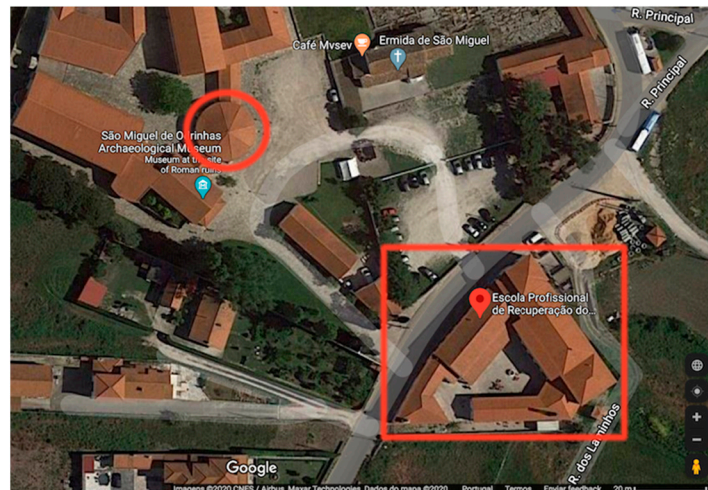


Figure 2. View of @GoogleMaps of the area occupied by EPRPS and the circular auditorium of Museu Arqueológico de São Miguel de Odrinhas [Retrieved 10 October 2019].



Figure 3. On the left side, the facade of the Archaeological Museum of São Miguel de Odrinhas (Source: <https://cm-sintra.pt/> (accessed on 10 October 2019)). On the right side, the EPRPS facade (Source: <http://www.escoladopatrimonio.pt/> (accessed on 10 October 2019)).

There are 10 classrooms, a chemistry and physics laboratory, a photography studio, a file division, library, cafeteria, bathrooms, secretaries' office, principal's office, pedagogical director's office, accounting office and counsellor's office. There are two bathrooms, one on each floor, the one on the ground floor containing changing rooms with showers, for both men and women, as well as a bathroom for the disabled.

In the field of Conservation-Restoration training, the authors would like to refer that they did not find similar training programs for European Qualifications Framework Level 4, but there is a wide range of this type of training course of studies at post-secondary degree levels, like Level 6 Professional Courses, Bachelors, Masters and Ph.D. programs [6,7] (p. 340).

1.3. Assistant in Conservation-Restoration Course of Studies

In 2006, this course program underwent certain restructuring. It was renamed Assistant in Conservation-Restoration Techniques, by Ordinance No. 1272/2006, of November 21st, corresponding to Level IV of the professionalization level, approved by Agência Nacional para a Qualificação e o Ensino Profissional.

As can be seen in Table 3, the practice areas are divided into Work-Related Training Classes and Theory and Practice of Conservation and Restoration, totalling 1050 h, similar to the Technicians for the Recovery of Built Heritage course program.

In the same year, the school also opened two new course programs, Photography Techniques and Interior and Exterior Design Techniques. Presently, these are the three programs with graduating classes presenting the Final Year Project (PAP), which grants students a Level IV of professionalization, recognized by ANQEP. ANQEP is a public institution, regulated indirectly by the Portuguese state, with administrative autonomy which assures the quality of vocational teaching in Portugal.



Figure 4. Interior courtyard of EPRPS. Source: <http://www.escoladopatrimonio.pt/escola.html> (accessed on 2 November 2019).

Table 3. Curriculum for the course program of Conservation-Restoration Assistants (formerly Technicians for the Restoration of Built Heritage course program).

		Subjects	Total Hours (a) (Training Cycle)
Training components	Sociocultural	Portuguese	320
		Foreign Language I, II or III (b, c)	220
		Integration Area	220
		Information and Communication Technologies	100
		Physical Education	140
		Art History and Culture	200
	Scientific training component	Physics and Chemistry	200
		Mathematics	100
		Theory and Practice of Conservation and Restoration (d)	630
	Technical training Component	Registration Techniques and Artistic Production (d)	300
		Technology and Material Behaviour (d)	180
		Examination Methods and Laboratory Analysis	70
Work-Related Training		420	
Total Year/Course Hours			3100

(a) The variants offered, alternatively, depend on the school's options, within the scope of its educational project, and also, depending on the legal nature of the education and teaching establishment, on its compliance with the provisions of the respective operating authorization, or with the one approved in the definition of the national training offer network, under the terms of paragraph 7 of article 5 of Decree-Law no. 74/2004, of March 26th. (b) Global workload, not segmented by the three years of the training cycle, to be managed by the school within the scope of its pedagogical autonomy, ensuring the balance of the annual load in order to optimize modular management and work-related training. (c) The student chooses a foreign language. If he/she studied only one foreign language in basic education, he/she must start a second language in secondary education. (d) This course program includes specific modules for each of the variants identified above.

Vocational education contributes to care, but simultaneously to the ability of reflecting on everyday knowledge, through heuristic learning [8]. Curricular knowledge and know-how allow students to overcome difficulties and obstacles in their art and heritage interventions [9] (p. 542).

The opportunity to learn through direct contact with heritage monuments has special meaning in the sense that there is a relationship of responsibility in the preservation of heritage property. The articulation between the transmission of knowledge and practice, outside the school environment (work in situ), places students in a privileged situation between art and the recognition of the public who visits it while they are at work [10] (p. 104).

Since its foundation, the aim of EPRPS has been to prepare students for the reality of work, with the integration of trans- and multidisciplinary teams, without forgetting those students who wish to pursue studies in higher education.

In the third and final year, after completing studies and training in six different areas of conservation in a work-related context, students prepare a final report for each area and present it publicly to a jury (Figure 5). The presentations of the Final Year Projects always have juries that “include the most outstanding national personalities in the field” [11] (p. 7).



Figure 5. Final Year Project of the Conservation and Restoration course program, academic year 2017/2018, held at the Centro Cultural Olga de Cadaval, Sintra. Source: EPRPS @Facebook.

Over the past few years, there has been an increase in the qualifications of the teaching staff, with many of the teachers/trainers having carried out or are carrying out professionalization in their appropriate groups. Even so, teachers of Portuguese, mathematics, physics, chemistry and art history have already completed their professionalization. The school has teachers that hold Level 5 EQF qualifications, Ph.Ds. (EQF Level 8), and a wide range of other qualified teachers and lecturers.

The EPRPS vision is one of an art school, focused on the area of heritage and art production, responding to the needs of the Municipality of Sintra, both at a national and international level [12] (p. 28).

The school’s mission focuses on training young people to value and preserve cultural heritage, which, considering the national context, is one of the greatest wealths that the country has. In this way, the training of young specialists in the preservation of national heritage has become essential and central to the future [12] (p. 29).

In addition to these essential points of the school’s mission, the training of young people for teamwork and critical thinking, as active members of the world, has become essential in integrating capable and independent people in a world that is changing more and more rapidly [12] (p. 29).

Bearing this premise in mind, EPRPS not only involves young students, but also families, partners and the municipality’s surrounding community. Some of these examples can be seen through the various activities carried out in the 2018/2019 academic year, such as citizenship activities regarding violence at school and dating, talks on safe sex, the exchanging of Christmas gifts, the presentation of the crib (nativity scene) to the Minister of Education and field trips (Figure 6).

In addition to these activities, EPRPS actively disseminates and competes for prizes and congresses. Examples of this, also during the academic year 2018/2019, are the heritage fair in Loulé, young talents in Porto (Figure 7), and the school’s participation in international congresses, such as InArt’20 in Paris.



Figure 6. On the (left), handing the crib to the Minister of Education, December 2019. On the (right), field trip to the Church of São Francisco, in Évora, to observe scientific research equipment in heritage, October 2019. Source: EPRPS @Facebook.



Figure 7. From left to right: Participations in Loulé, Porto, Funchal and Lisbon. Source: EPRPS @Facebook.

The fundamental values of this school are in accordance with the Student Profile on Completing Mandatory Schooling, summarized in five essential points:

- Responsibility and integrity;
- Excellence and rigor;
- Curiosity, reflection and innovation;
- Citizenship and participation;
- Freedom.

In this way, it seeks to develop not only the goals extended by the Ministry of Education, but also the shaping of a student into a global citizen, who is capable, participates and is the builder of a better future.

With the opening of new course programs, we follow the evolution of the municipality and the demand for local needs and thus contribute to economic growth and the reduction of the unemployment rate [9] (pp. 545–546) [13] (p. 552). EPRPS is focused on educating and training younger generations in direct relation with employment needs, taking into consideration the sector qualification strategies related to heritage [14] (p. 55).

2. Work-Related Training

The combination of other subjects with the practice of conservation and restoration demonstrates the transversality of the area, showing students the importance that each area has in their future professions: Portuguese is essential in the writing of their final reports for their final projects; mathematics for calculating cleaning solutions or the percentage

of the two components of materials to be able to make a mould; descriptive geometry for measuring arches, profiles and surveying overlays, among others; drawing and technical design for graphic surveys of the state of conservation of pieces; chemistry and physics to analyse and examine matter during intervention, obtaining a deeper knowledge, such as the analysis of soluble salts to detect their origin (Figure 8); English (or other foreign languages) to interact with the public visiting the works on location and to be able to access information in technical books in the area, which are mainly foreign; the importance of art history to support knowledge of the work being intervened, from a stylistic-artistic and temporal analysis.



Figure 8. Sampling of surface salts (efflorescence).

Undoubtedly, interdisciplinarity in conservation and restoration is extremely important, as well as in other areas, and in line with what Ana Mae Barbosa says, this interdisciplinary teaching enriches the learning of further knowledge, subjects and activities of students [15] (p. 41).

Training the eye awakens students and provides them with a greater sensitivity to contemplate other heritage, in their daily lives. The attentive look generates a critical opinion in relation to our heritage.

Thus, a record of the state of conservation begins by elaborating a diagnosis in order to arrive at the methodology to be adopted for its preservation, always respecting the values of the work, thus avoiding erratic interventions and losses to our heritage. Students become aware that conservation and restoration provides a more in-depth study of a property, from its construction to the present day, through the various campaigns that sometimes alter whole decorative aesthetics.

However, it is also through the notions of photography, which record the general and the detail, that a photographic survey is conducted in conservation and restoration. Photography records all the moments of the intervention, before, during and after.

Then, the photographs are transferred onto a graphic record, and the student is left with the choice of the means to develop it, whether manually or digitally (Figure 9).

The first step is to diagnose and proceed with the cleaning of the piece, by opening window polls to understand if there are other paint layers beneath the visible layer and perform solubility tests to find the most suitable solvent and substance to be removed. After this, mechanical and chemical cleanings are applied, considering the nature of materials and the need to appropriately clean the artwork without damaging it [16] (p. 137) (Figure 10).

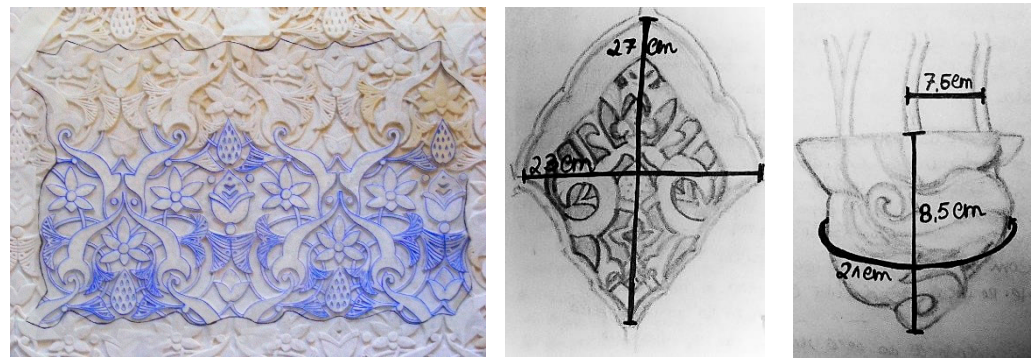


Figure 9. On the (left), graphic survey of the ornamental decoration of each plaque that makes up the parietal cloth of the Monserrate Palace in Sintra, carried out by a student (academic year 2008/09). In the (centre) and on the (right), free drawing with notes of the dimensions of the ornamental elements of the arch in the central turret of the Monserrate Palace in Sintra, carried out by a student (academic year 2014/15).

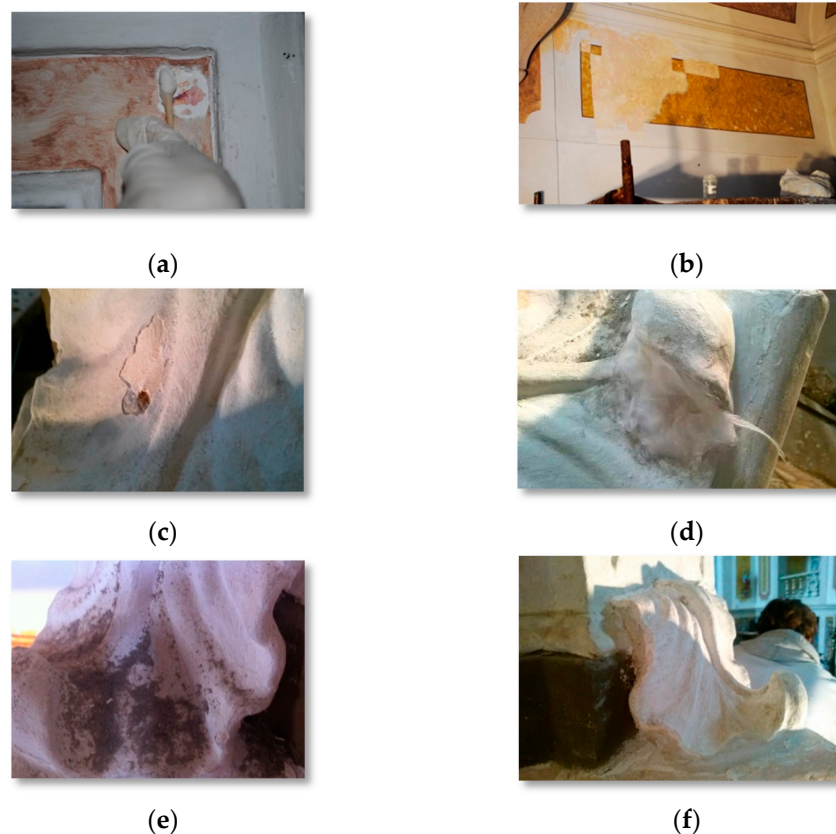


Figure 10. (a,b) Window polls to see if there are other paintings underneath. (c,d) Mechanical and chemical cleaning. (e,f) Example of the ornament before and after the intervention.

While this first step of conservation and restoration methodology proceeds, an interdisciplinary team advances with a preliminary characterization, within the Analytical Methods class and helps the conservation team to identify some organic and inorganic dirt deposition and previous chromatic applications. For this, macro photography with visible light was used to identify lichen in the first image. On the other hand, ultraviolet light was applied to unveil previous chromatic applications as can be seen by different fluorescence on the plaster's surface [17,18] (Figure 11).

After appropriate cleaning proceedings, consolidation of different areas is done with injections. This step of conservation is important to ensure that the heritage does not disaggregate and maintains its cohesion and preservation. It is also important to do this before the volumetric reconstruction, to ensure structural stability to the artwork (Figure 12).

Volumetric reconstruction involves many steps to ensure the appropriate results, respecting the original piece in question and the heritage context of the artwork. Studies of volume are made with appropriate tools, and in this case, a frame was made and added to the pulpit (Figure 13).

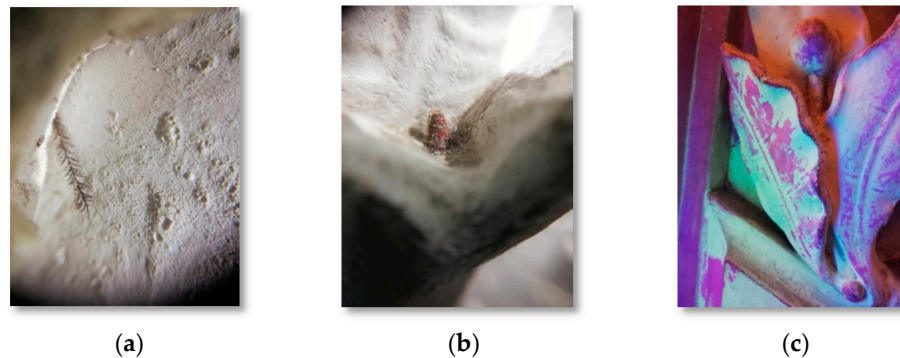


Figure 11. (a,b) Macro photography (detail) of inorganic dirt deposition areas. (c) Photograph of fluorescence caused by ultraviolet radiation which allows the identification of different chromatic applications (inks).

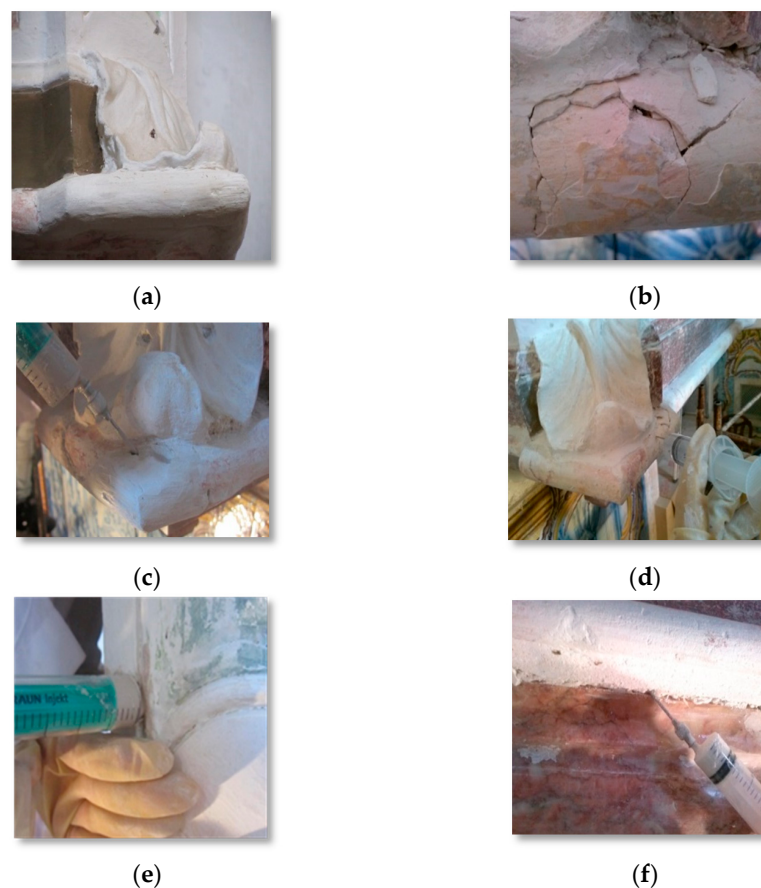


Figure 12. (a,b) Areas with a lack of cohesion. (c–f) Consolidation methods by injection in four different locations in the pulpit.

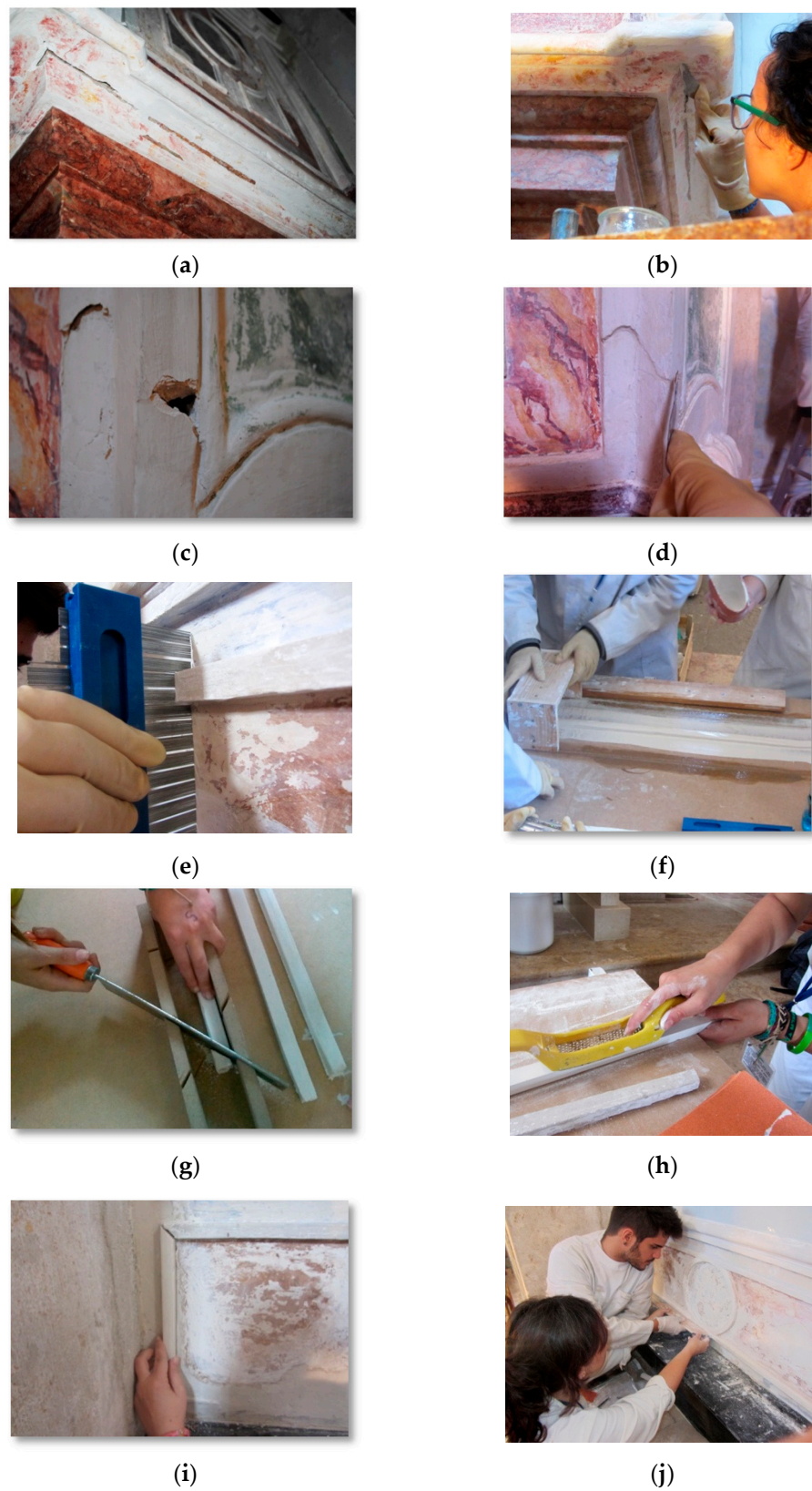


Figure 13. (a–d) Volumetric reconstitution through the addition of masses. (e–h) Volumetric reconstitution by means of a mould for restoring the reading. (e) Removing the profile of the frame to be reproduced. (f) Making the mould on a bench using the mould. (g,h) Preparation and levelling of the replicas. (i) Replication test on site. (j) Bonding and levelling.

The last step of the conservation and restoration methodology, involves chromatic retouching with which the artwork regains visual respect (Figure 14).

During the training period, the applied methodology is also based on a set of questions posed by the teacher, so that the student, even if in practice, is always attentive to the ethics of conservation and restoration.

In several interventions, work is developed according to the state of conservation of the piece in which you are going to work: sometimes the intervention is reduced to cleaning, one of the most demanding steps and which requires the teacher to pay extra attention during teaching—patina, the mark of time has to be respected and never cancelled; other times we have to move to volumetric reconstruction when there is the need to restore physical integrity, structural stability and its reading. For this, the transmission of ancestral techniques, techniques that plasterers used in these ancient works with grand decorations in stucco, are passed on to the students—from sculpting on site, silicone moulds and moulds of mould (sliding moulds for the obtaining of straight and/or circular and crown mouldings). Raising awareness of the historical-artistic heritage through this know-how, allows them to understand a world that stems from multiple encounters: from thinking, feeling and acting to ultimately preserve a memory [19] (p. 8).



Figure 14. (a,b) Example of mimetic chromatic reintegration.

3. Conclusions

The first year of this course program in 1989 evolved until 2006, when the program was designed as it is today. Since 2020, the school has a wide range of faculty members from Level 5 teachers to Level 7 and 8, such as Ph.D. professors.

This type of training makes students question, reflect and contribute to the emancipation on the future role of “looking” at heritage [3] (p. 112).

We intend to continue to be a reference at the level of vocational education in the field of conservation and restoration, to train young adults to value and care for our cultural heritage for an active citizenship in communion with society, by preparing them for the world of work and to help them overcome the various difficulties which may arise in professional life. With the opening of new programs, we are following the evolution of the municipality and the demand for local needs and thus contributing to economic growth and the reduction of the unemployment rate.

It is our school’s goal to share and assure the quality of our work at a national and international level, and to continue with partnerships and protocols with companies in the areas to respond to public or private demand.

Some of the work done with students from vocational-technical schools is presented, to show the transmission of traditional know-how. The relevance of applying traditional construction techniques for the conservation and restoration of plaster and the transmission

of technical knowledge through teaching is essential for the diagnosis. This knowledge will teach students how to intervene properly in what is heritage.

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