
Versión en INGLÉS

Learnings and reflections from the professional internship at the Tokyo National Research Institute for Cultural Properties in 2014

Tania Estrada Valadez*

*Coordinación Nacional de Conservación del Patrimonio Cultural
Instituto Nacional de Antropología e Historia

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Translated by Azrid Arai Andrade Arroyo

Abstract
In 2014, I had the opportunity to attend a professional internship of almost four months at the Tokyo National Research Institute for Cultural Properties (TNRICP) and the Shugo Conservation Studio. Some of the knowledge gained from that experience is shown in the first section of the article, focusing on *washi* (Japanese paper), *shinnori* (wheat starch paste-adhesive), and *karibari-ita* (panel or board for pasting temporarily). In addition, some fundamental points are mentioned for the understanding and knowledge of each one. In the second part, a reflection is made on work dynamics observed within the Shugo Conservation Studio. It is hoped that the reflections and lessons shown in this article will be of help to the readers and that it will encourage them to learn more about Japanese mounting techniques, materials, and tools, as well as their works of art and culture.

Keywords
Paper conservation; professional internship; Japanese materials, tools, and mounting techniques; Tokyo National Research Institute for Cultural Properties.

Background

Since 2012, the International Course on Paper Conservation in Latin America: Meeting East has been led by conservator Marie Vander Meeren together with a team of conservators at the Taller de Documentos Gráficos (TDG)[1] of the Coordinación Nacional de Conservación del Patrimonio Cultural (CNCPC)[2] of the Instituto Nacional de Antropología e Historia (INAH)[3] and organized along with the Tokyo National Research Institute for Cultural Properties (TNRICP) with the support of ICCROM. The aim of the course is to provide the basic concepts of Japanese techniques, materials, and tools for the conservation of works on paper and their adaptation to the Ibero-American context.[4]

Since the first edition of the course, the relations between the professors who teach the course, from the CNCPC and TNRICP institutions have been strengthened, therefore, the conservators who are part of the TDG team have been invited to carry out professional internships at TNRICP since 2012. In the same year, Marie Vander Meeren attended the Japanese Paper Conservation Course (JPC), taught in Japan, to observe the didactic methodology of the course. In 2013, Patricia de la Garza Cabrera –along with Marie Vander Mereen– was invited to participate in the JPC courses and the Course on Conservation of Japanese Artworks on Paper and Silk taught in Berlin,[5] as well as to hold an internship at the Shugo conservation studio at TNRICP. In 2015 and 2016, Jeniffer Ponce Fernández and Ana Dalila Terrazas Santillán, respectively, carried out practical exercises in the TNRICP laboratory under the guidance of several Japanese professors. This article seeks to share some of the learning and personal reflections from my internship in 2014.

Earthliness and technique

During the internship, I became accustomed with Japanese works of art (*honshi*) elaborated with painting techniques or calligraphy on paper or silk and which are generally mounted with Japanese methods, that present and protect at the same time, such as *kakejiku* or *kakemono* (hanging scroll), *makimono* (handscroll), *byōbu* (folding screen) and *hon* (Japanese book).To appreciate them, they must be unrolled, unfolded, or opened, which differs from the traditional Western art on paper, however, it is like the mechanism of books. To understand their manufacture and mounting, a hanging scroll and two books were made during the internship, in addition to calligraphy and silk painting exercises (figure 1).

While carrying out each of these exercises, I learned about the use of the material, the application of Japanese mounting techniques, as well as the care and maintenance of the tools, which can be adapted to the conservation of works on paper in the West.

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[1] Documentary Heritage Conservation Studio (note from the translator).

[2] National Agency for Cultural Heritage Conservation (note from the translator).

[3] National Institute of Anthropology and History (note from the translator).

[4] As a reference of the course, the following articles can be consulted: "International Course on Paper Conservation in Latin America. Meeting East. An evaluation after five years" which was published in the 17th issue of the *CR. Conservación y Restauración* journal, as well as "Curso internacional de conservación de papel en América Latina. Un encuentro con Oriente: una propuesta de reflexión, vinculación y difusión en tiempos de SARS-CoV-2" in the special edition of the same journal. The following video can be consulted as well: El Curso internacional de conservación de papel en América Latina. Un encuentro con Oriente, on the YouTube channel: CNCPC Conservación México.

[5] The course was taught at the Museum für asiatische Kunst (Museum of Asian Art in Berlin) to introduce the techniques of manufacture and conservation of works on paper and silk applied to structures such as *byobu* and *kakejiku*.

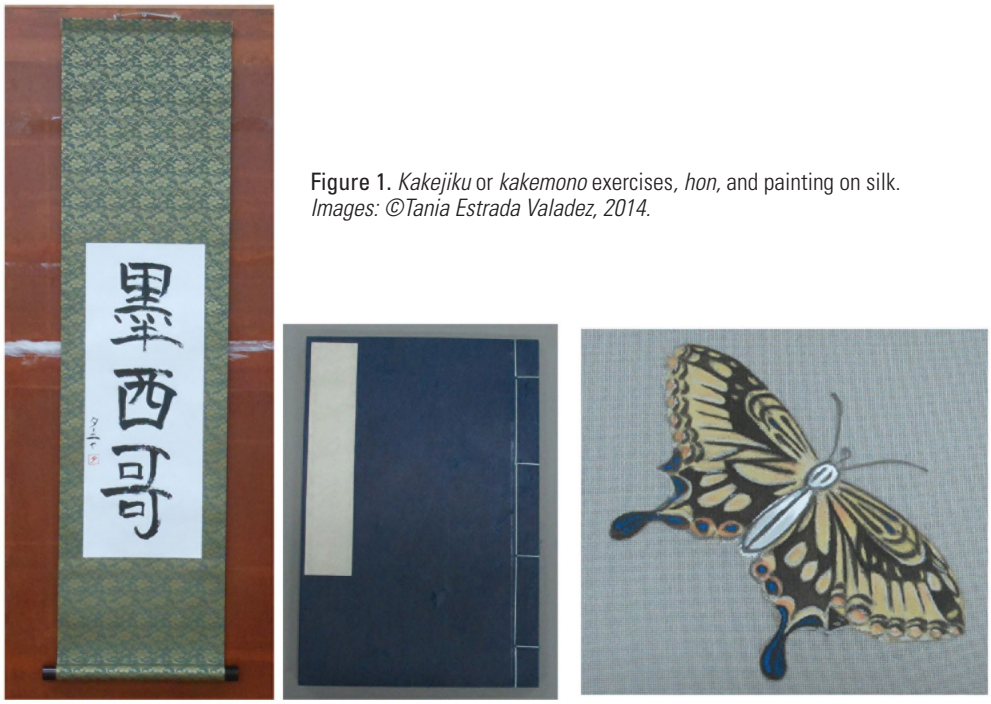


Figure 1. *Kakejiku* or *kakemono* exercises, *hon,* and painting on silk. *Images: ©Tania Estrada Valadez, 2014.*

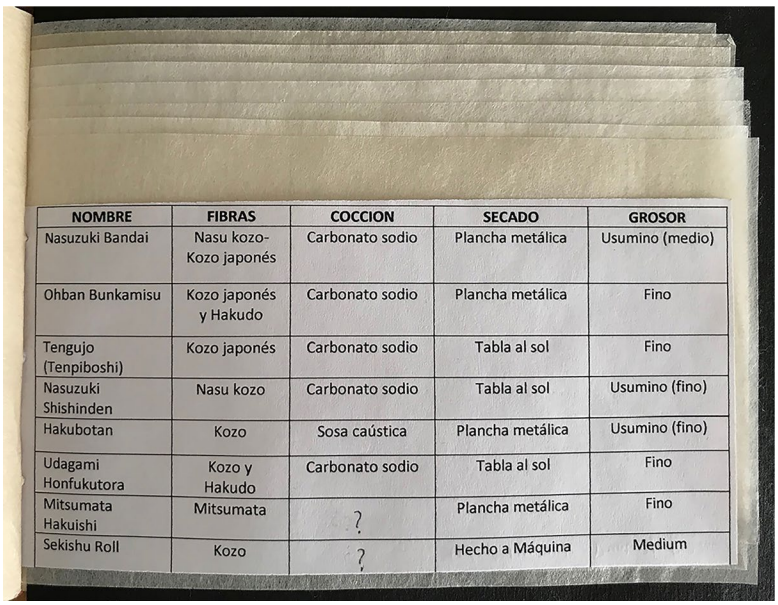
Regarding the materials, I deemed it important to highlight two fundamental points for paper conservation, both in Japan and in the West, as well as a very useful Japanese tool. The following are some fundamental points for its understanding and knowledge:

Washi [6]

- The generic term used to describe paper manufactured in Japan (Crespo & Gear, 2020: 27).
- It is one of the most common supports for Japanese works along with silk.
- The most used fibers for its manufacture are *kōzo, gampi* and *mitsumata*. Each of these fibers gives the paper different physical characteristics.
- The same fiber can have different physical characteristics according to the place where it was produced, for example, *kōzo* grown in northern Japan, where the climate is colder, has more compact and thinner fibers.
- Variations in the manufacturing process, even if it is the same fiber, can also produce different physical characteristics, for example, a *kōzo* from which the inner bark has not been removed produces a paper with thicker fibers, therefore, it is very resistant and greenish-white in color, which they call *Sekisu-shi.* Whereas, *kōzo* that has been carefully washed to remove impurities may be a thinner but tough white paper, is called *Minogami.*
- The name of the paper may refer to its origin, for example, *Usumino* or *Minogami* comes from the Mino area.

[6] The following information are notes I took during the internship based on what my professors Masato Kato, Kyoko Kusunoki, Yuko Yamada, and Rika Yamanoue told me, as well as from the visits I made to the Washi museums in Tokyo and Kochi. It is important to mention that I also reviewed the bibliography on this subject.

- The manufacturing process uses mucilage extracted from the root of certain plants, such as *tororo-aoi* called *Neri*, which disperses the fibers to avoid the formation of fiber accumulation during the formation of the sheet and to control the speed at which water passes through the mould, making it more viscous, which facilitates the formation of very thin but resistant papers (Katsuhiko, 1985: 35).
- Fillers are added to some papers to give them other physical characteristics related to their use, such as *Misu* paper, to which calcium carbonate is added, while *hakudo*[7] is added to *Uda* paper.
- As a paper conservator, it is important to know about the manufacturing process and materials of Japanese paper, since it helps to make better decisions while acquiring the paper, and to know exactly what is placed in the works of art during its intervention.
- Before buying Japanese papers, it is recommended that you think about their intended use to choose the best paper according to their characteristics.
- You can ask your supplier the type of fiber used and its percentage (sometimes blends are made), substances added during cooking and bleaching, how it was dried, and whether it was made in Japan.[8]
- You can also request paper samples to see their physical characteristics, such as color, texture, and thickness, to create sample books with the information provided by the supplier (figure 2).



NOMBRE	FIBRAS	COCCION	SECADO	GROSOR
Nasuzuki Bandai	Nasu kozo-Kozo japonés	Carbonato sodio	Plancha metálica	Usumino (medio)
Ohban Bunkamisu	Kozo japonés y Hakudo	Carbonato sodio	Plancha metálica	Fino
Tengujo (Tenpiboshi)	Kozo japonés	Carbonato sodio	Tabla al sol	Fino
Nasuzuki Shishinden	Nasu kozo	Carbonato sodio	Tabla al sol	Usumino (fino)
Hakubotan	Kozo	Sosa caústica	Plancha metálica	Usumino (fino)
Udagami Honfukutora	Kozo y Hakudo	Carbonato sodio	Tabla al sol	Fino
Mitsumata Hakuishi	Mitsumata	?	Plancha metálica	Fino
Sekishu Roll	Kozo	?	Hecho a Máquina	Medium

Figure 2. Example of a sample book of Japanese papers used during the professional internship at the Biblioteca Nacional de España (National Library of Spain) in 2015.

[7] *Hakudo:* It is a white pigment; its main component is aluminum silicate or magnesium silicate (Miyasako *et al.,* 2010: 46).

[8] For further reference on the characterization of the paper and data to be collected, you can consult the paper by Ana Dalila Terrazas presented at the 4to Coloquio internacional sobre líneas de trabajo en materia de conservación y restauración en bibliotecas y archivos en el 2017, with the subject: "Muestrario de papeles japoneses: estudio de sus características para su uso en restauración de obras occidentales con soporte de papel".

The TDG has Japanese papers that were purchased in the 1980s and not all the information mentioned before was known, so during my internship I identified the fiber of some papers at the request of Marie Vander Meeren. For this purpose, I followed the methodology of the fiber identification class given by Masato Kato during the International Course on Paper Conservation in Latin America: Meeting East. In case you have papers in your studios with unknown fibers, it is recommended to follow the methodology mentioned above for their identification.[9] For the analysis, Graff C staining solution was prepared, and samples of each paper were mounted on a microscope slide stained with the solution and observed under a microscope with transmitted light for identification. As a result, I obtained a table with the fiber identification of twenty papers, four of which are shown below:

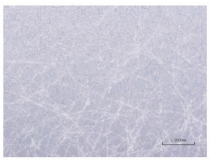
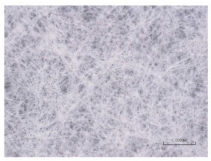
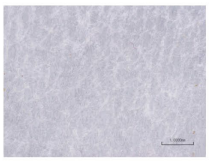
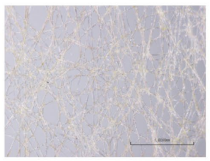
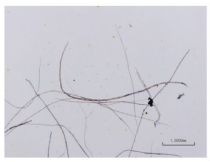
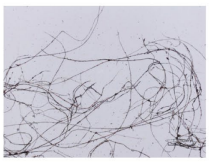
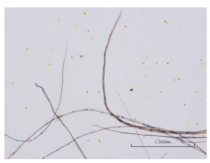
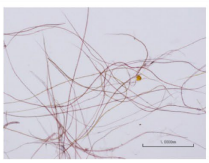
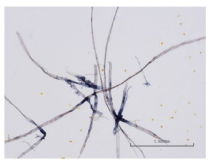
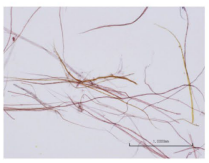
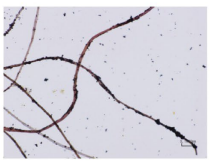
No.	1	2	3	4
Nombre del papel	Ultra delgado	Japonés desconocido	Delgado industrial	Tubo 3: ultra delgado
Color de fibra	Rojo oscuro	Rojo oscuro, cafesoso, morado	Rojo	Rojo
Largo de fibra	Largo	Corta	Largo	Largo
Forma	Popote aplastado	Popote aplastado	Popote aplastado	Popote aplastado
Fibra	Kozo	Kozo	Kozo	Kozo
Terminación de fibra	Natural	Natural recta	Natural	Natural recta
Papel a luz media				
Vista general				
Vista media/fibra				
Fibra/ terminación				

Table 1. Identification of fibers in four TDG papers. *Table: Tania Estrada Valadez, ©CNCPC-INAH, 2014.*

[9] To consult the fiber identification methodology, you can review the support material of the online seminar: Experiencias y reflexiones del Curso internacional de conservación de papel en América Latina. Un encuentro con Oriente 2012-2019, held in December 2020.

Shinnori[10]

- It means "fresh adhesive" or simply "adhesive" in Japanese and refers to wheat starch paste (WSP).
- In Japan, it is used especially for the mounting of Japanese works of art, while in the West it is used for the conservation of works of art on paper and books.
- One of its characteristics is that it is reversible in water, which is why it has been used for the mounting of works of art in Japan for hundreds of years.
- It must be cooked to prepare it, and many variables generate different results. The following are some of the observations recorded during the internship:
    - Origin of the wheat starch: In the conservation studio they used a purified starch (gluten-free), which they call *shōfu* and is slightly moist (figure 3, left).
    - Soaking in deionized water: The starch is placed in a bucket, and deionized water is added and mixed to keep it wet. The water is changed to keep it clean and fresh, and it is stored in a refrigerator. The soaking in water should be at least 24 hours before cooking (figure 3, center).
    - Preparation for cooking: The starch is taken from the bucket (previous step), the water is removed, and it is weighed according to the quantity required for its use. Deionized water is added again. The proportions are designated under the following starch:water ratio (weight:volume), they vary according to the environmental conditions, for example: if the day is hot and dry, a 1:5 ratio (starch:water) could be used to counteract the dryness of the environment and prevent the starch from drying out during cooking.
    - Cooking method: It has always been prepared on a special gas stove on direct flame.[11] During cooking, a wooden stick is used to keep the paste in constant movement and prevent it from burning (figure 3, right).

Figure 3. Unsoaked *shōfu* starch, *shōfu* starch soaked in deionized water, and a special stove where the starch was cooked. *Images: ©Tania Estrada Valadez, 2014.*

[10] The following information is notes I took during the internship based on what my professors Masato Kato, Atsushi Ogasawara, Yuko Yamada, and Haruka Nakamura told me. It is important to mention that I also reviewed the bibliography on this subject.

[11] It can also be cooked on an induction stove, electric hot plate, and microwave.

- Cooking time depends on many variables, such as the amount of starch being cooked, the amount of water added during preparation, hydration time during soaking, environmental conditions during cooking, cooking method, among others.
- Cooking temperature: The aim is to reach a temperature higher than 50 °C or 60 °C to promote the rupture of the starch molecule and generate gelatinization (Hayakawa, 2011: E133). While cooking in the internship, the WSP reached temperatures between 85 °C and 87 °C.
- Storage: Once cooked, it is placed in a plastic container (figure 4, left), and allowed to cool to room temperature. When it is at equilibrium with that temperature, the lid is placed on it, and it is stored in a special refrigerator that keeps it at 16 °C. It was never stored in conventional refrigerators at 4 °C because it promotes retrogradation and the starch loses its adhesive properties (Hayakawa, 2011: E133).
- For use in the study: A portion of the starch paste was sieved using the *norikoshi* (paste strainer), wooden shovel, *noribon* (wooden paste try), and kneaded on the *noribon* with the *noribake* (paste brush) diluting little by little with deionized water (figure 4, right). The different dilutions depend on the intended use.

Figure 4. Wooden starch paste in a plastic container and preparation for use. *Image: ©Tania Estrada Valadez, 2014.*

- It is important to mention that in the conservation studio, WSP was cooked every Monday and the amount was defined according to the activities programmed for that week so that its use was enhanced to avoid waste.
- As previously mentioned, starch cooking depends on many variables, so a journal is kept in the studio to record observations, which helps to keep a record that helps to evaluate the result of the starch cooking process (table 2).

During the internship, I noticed that each conservator has their own way of preparing WSP and that several methodologies and recipes can be consulted on the Internet. Since there are many variables, it is recommended to practice the preparation of the starch, experiment, observe the changes during cooking, as well as to keep a record through the journal to be able to evaluate results.[12] As Paul Willis (1984) mentions about starch preparation: "it is experience that has more to do with producing a good paste than following a recipe".

[12] There is an updated journal proposal available in the support material of the online seminar: Experiencias y reflexiones del Curso internacional de conservación de papel en América Latina. Un encuentro con Oriente 2012-2019, held in December 2020.

Bitácora de cocción de almidón						
Fecha	**Proporción almidón:agua (g)**	**Estado del almidón antes de su cocción**	**Método de cocción**	**Tiempo total de cocción**	**Nombre de las personas que lo cocinaron**	**Observaciones**
05.03.2014	850:2040	Húmedo	Estufa de gas	55 min	Yuko, Haruka y Tania	Buena proporción de almidón:agua.
25.04.2014	1200:3120	Húmedo	Estufa de gas	50 min	Haruka y Tania	Buena consistencia de la pasta.
28.04.2014	1200:3200	Húmedo	Estufa de gas	50 min	Haruka	Pasta utilizada para la construcción de *karibari-ita*, pasta débil.
30.04.2014	1000:2500	Húmedo	Estufa de gas	50 min	Haruka y Tania	Pasta fuerte, contiene menos agua para utilizar en *karibari-ita*.
06.05.2014	1200:3200	Húmedo	Estufa de gas	50 min	Haruka y Tania	Pasta un poco débil.
08.05.2014	1200:3200	Húmedo	Estufa de gas	50 min	Haruka y Tania	Buena pasta, más fuerte.
09.05.2014	1200:3120	Húmedo	Estufa de gas	50 min	Haruka y Tania	Pasta más fuerte que la que se hizo ayer.
12.05.2014	1500:4275	Húmedo	Estufa de gas	60 min	Haruka y Tania	Pasta un poco débil, pero buena.
13.05.2014	1200:3120	Húmedo	Estufa de gas	50 min	Haruka y Tania	Sin comentarios.

Table 2. Wheat starch paste cooking personal journal during the internship in 2014.
Image: ©Tania Estrada Valadez, 2014.

Karibari-ita[13]

- The literal translation of *karibari* is "pasting temporarily" since *kari* means "temporal" and *bari* means "to paste". *Ita* means "panel" or "board", therefore, *Karibari-ita* is "panel drying with tension temporarily" (Kato and Takayuki, 2015: 91, 92).
- It is used in Japan to dry with tension both Japanese works of art on paper and silk, after their conservation, as well as for mounting. The tension helps to keep the silk or paper flat and stable during the drying process (Kato and Takayuki, 2015: 91) (figure 5).
- Its structure is composed of a reticulated wooden frame. On it, seven or eight layers of different Japanese papers have been glued with WSP in different dilutions. In the end, *kakejiku* (persimmon juice) is applied, that has waterproofing properties that make it possible to easily adhere and separate the adhered works of art on the panel.

Figure 5. Lining calligraphy works to the *karibari-ita* by the edges of the lining paper.
Image: ©Tania Estrada Valadez, 2014.

[13] The following information are notes I took during the internship based on what my professors Masato Kato, Atsushi Ogasawara, Sayaka Inoue, Keita Shirai, Kyoko Kusunoki, and Haruka Nakamura told me. It is important to mention that I also reviewed the bibliography on this subject.

At the end of the internship, I had the opportunity to participate in the construction of five *karibari-itas*, for which everything necessary for each layer was organized, as well as the space to execute each task safely. As mentioned above, Japanese papers have been gued to the wooden mould in such a way that layers are created; therefore, all the material was first prepared, and the cutting methods could be put into practice, such as squaring efficiently the edges of the Japanese papers or using tools like the *marubocho* (round knife), as well as bonding methods in squared papers to form scrolls (figure 6). Since these papers are being adhered, it was necessary to prepare, cook, sieve, and dilute the WSP to different starch consistencies, as well as to apply it to the Japanese paper with the different Japanese brushes and place it on the *karibari-ita* (figure 6).

It was also an opportunity to learn about the physical characteristics and properties of the different Japanese papers that are used, since they are intimately related to the function that each layer will have in the *karibari-ita*, as well as to understand in-depth how this tool works to dry with tension.

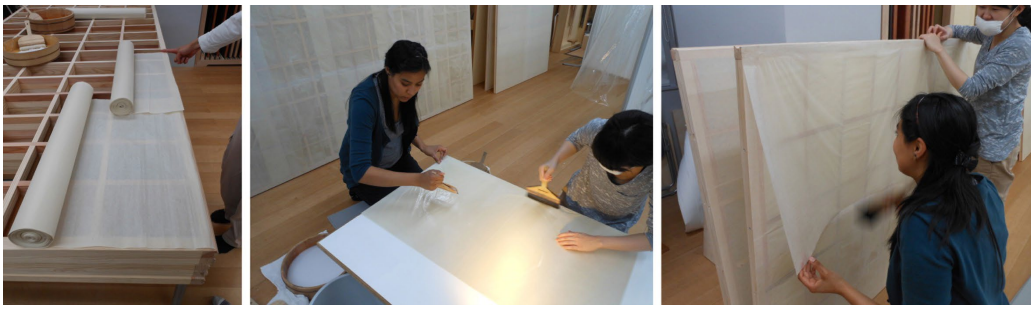


Figure 6. Paper scrolls for the first layer on *karibari-ita*, application of WSP on the paper, and placement of the paper with WSP on the *karibari-ita*. *Images: © Tania Estrada Valadez, 2014.*

Assisting in the construction of the *karibari-itas* was a very enriching challenge, as it required putting into practice the Japanese techniques learned, as well as the use, care, and maintenance of the tools. What has been learned can be translated and applied to the conservation of works on paper in the West. For example, knowing and understanding the characteristics of the different Japanese papers to decide in which cases it can be applied to the paper based object during its intervention, as well as the preparation, cooking, sieving, and dilution of the WSP, because the correct application of this knowledge to the paper based object has a significant impact on the results—if WSP is not well cooked it simply will not have the expected adhesion. Furthermore, the techniques used for the construction of *karibari-ita* can also be applied to paper conservation such as lining, the different types of cutting on Japanese papers, and the correct use of Japanese tools such as the *noribake* (paste brush) and *nadebake* (smoothing brush), just to mention a few.

It is important to mention that, after my internship in 2014, a *karibari-ita* was carried out together with the conservators of the TDG; therefore, I had the opportunity to share the recently acquired experience, which was enriched and nurtured with the information that Marie Vander Meeren and Patricia de la Garza Cabrera obtained in 2012 and 2013. The result was a Mexican *karibari-ita* that involved great teamwork, a lot of communication, as well as meticulous planning of each task involved (figure 7). Although at the beginning there were some difficulties in the construction of this tool, such as finding Mexican materials with similar characteristics to the Japanese materials and adapting the papers that were in the studio to fulfill the expected function in each layer, good results were obtained in the adaptation since, until now, it is in perfect condition and is still in use seven years after its construction.

Figure 7. Conservators of the TDG during the construction of the Mexican *karibari-ita* in 2014.
Images: TDG, ©CNCPC-INAH, 2014.

Spirituality and intangibility

During the three and a half months of the internship, there was an intense introduction to the mounting techniques, materials, and tools used for the creation and restoration of Japanese artwork; however, other knowledge was also integrated. Being immersed in Japanese culture, and participating in the dynamics of work within TNRICP and the Shugo Conservation Studio, certain practices were acquired that at first may seem obvious and simple but made a professional and personal difference.

There are professional ranks in the conservation studio: senior conservator, chief conservator, conservator, and conservation assistant. The highest-ranking conservators are in charge of executing the interventions and mounting the workof art, they also teach the conservation assistants, who learn by observing in silence and without explanations, leading to a great concentration that allows the grasping and assimilation of the teachings.

In addition to learning by observation, conservation assistants have other tasks –some of them are mentioned below– which sensitize and promote awareness of their movements. After ten years of being in that rank, they can aspire to become a conservator and finally intervene in the work of art,. To achieve this they must pass a professional exam. for which they must pass an exam before, it is like a conservation college. Upon learning about this situation, I reflected on the importance of experience. Sometimes it is believed that one becomes an expert simply by attending a course or completing a degree, however, years of prolonged practice are necessary to begin to understand the profession.

It is also important to mention that, although there are different professional levels, there is a deep respect and harmony in the work environment, since everyone understands their role in the studio, and they are aware that each person is valuable for teamwork.

Respect is extended to the works of art and traditional techniques; conservators are depositaries of millenary techniques. They are also in charge of maintaining their national treasures, objects that have survived for hundreds of years, so they recognize the importance of studying, researching, and understanding them before undertaking their intervention, as well as updating themselves to develop new techniques.

Teaching is based on repetition, for example, one of the first performed tasks was to learn how to sharpen the *marubocho*. It was observed how it was done and then practiced for almost a week, it was understood that practice makes perfect, and the importance of remaining open to the fact that one can (and should) always improve.

There is meticulous planning of the activities every week, although the conservation studio is small, they divide the space to make the best of it, which involves constant communication with the work team. In addition, there is a conscious organization of tasks either as a team or individually. For example, some of the functions of the conservation assistants are to cook the WSP every Monday, to keep the studio clean—they clean at the beginning and end of the activities—, to prepare the materials for the paper based materials and to maintain and take care of certain tools, such as the Japanese brushes, among others (figure 8).

During the short time I was in the studio, I was able to perceive and understand the importance and emphasis on cleanliness and order. Although this methodology was already known at the TDG due to Marie Vander Meeren, the experience acquired in the conservation studio prompted a growth in the field that turned into a habit. Moreover, order also refers to having in the workspace what is necessary to perform the activity, foreseeing the materials and tools to be used, and removing everything that may be a distraction.

In the multiple activities and tasks carried out, it was forewarned that the whole body is involved, so it is necessary to be aware and concentrated to execute more precise movements and to avoid mistakes or accidents. Some of the exercises that require full concentration are cutting with the *marubocho,* and *urauchi* (lining). In the first one, it is necessary to place a foot, a hand, and the weight of the whole body on the ruler to immobilize it, and then the cut is made. In the second one, the coordination of the hands and arms is required when applying the WSP to the paper, lifting it, and placing it on the work (figure 8).

Finally, all the teachers at the internship were always willing to show and teach their knowledge, their generosity has been transcendental and has fostered the desire and enthusiasm to share what has been learned.

Figure 8. Preparation of the material for cutting with *marubocho* and *urauchi* exercise.
Images: ©Tania Estrada Valadez, 2014.

Even though almost seven years have passed since I attended the internship, the experience remains relevant because it was a turning point in ny professional development, much of the knowledge acquired has evolved and made sense over the years. I consider that one of the most valuable, yet challenging learnings is to try to put into practice, day by day, the values and the way of working described in the Spirituality and intangibility section.

It might seem that many of the experiences shared in this paper cannot be replicated in the West since the Japanese tools, materials, and mounting techniques were designed specifically for Japanese works of art, however, the TDG conservators have achieved a collective evolution and reflection that led to the adaptation of Japanese tools and techniques, which are taught at the International Course on Paper Conservation in Latin America: Meeting East.

It is worth mentioning that the TDG has sought to share the experiences and knowledge that each of the conservators has gained through their internships since the exercises, practices, and teachers were different. This has generated a collective reflection that has enriched the work of the studio, which has benefited both the documentary heritage being conerved and the participants of the International Course on Paper Conservation in Latin America: Meeting East since the aim has been to transmit what has been learned in the different editions of the course.

To conclude, I hope the learnings and reflections expressed in this paper will be useful for the readers and will encourage them to learn more about Japanese mounting techniques, materials, and tools, as well as their works and culture.

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