

Co-creating scientific knowledge towards the technological memory of the glazed ceramics production

Marluci Menezes

LNEC, Lisbon, Portugal, marluci@lnec.pt

Sílvia R. M. Pereira

LNEC, Lisbon, Portugal, spereira@lnec.pt

Maria de Lurdes Esteves

MNAz, Lisbon, Portugal, mesteves@mnazulejo.dgpc.pt

Alexandre Nobre Pais

MNAz, Lisbon, Portugal, apais@mnazulejo.dgpc.pt

SUMMARY: This reflection discusses and deepens the methodological paths of construction and innovation of scientific knowledge on the memory of the technological processes of production of glazed ceramics, their materials, ways of doing and know-how dynamics. To this end, it addresses the notion of co-production of scientific knowledge related to the study of these memories. The aim is to discuss the contributions with/using a dialogic perspective between social sciences/anthropology, history/art history, conservation/restoration, natural and exact sciences, and digital technologies. More specifically, the synergetic dynamics between a historical and anthropological perspective of the construction of knowledge, in which the use of qualitative methodological approaches and devices predominates, and a technical-scientific, experimental and laboratory approach to the production of scientific knowledge, also highlighting the potentialities that digital technologies can have in increasing this purpose. In the development of the work, we use specialized literature and provide examples, where we examine studies based on research projects, observing achievements, challenges, and opportunities of co-creating scientific knowledge.

KEY-WORDS: Glazed ceramics; Technology; Production know-how; Interdisciplinarity.

CO-PRODUCING SCIENTIFIC KNOWLEDGE

In a previous work, the importance of studying glazed ceramics, namely tiles, was defended with the aim to value the not so visible aspects of its industrial production – the materials, the technical processes used and the underlying production know-how [1]. Towards the same purpose, it was considered of interest to deepen the scientific knowledge from three articulated lines of investigation: historical, material characterization and replication, and the collection of oral narratives around the themes of the memory of technological production. For the present reflection, this tripartite perspective of the study of glazed ceramics, in general, and tiles, in particular, is taken up and deepened, considering the dialogical contribution between social sciences/anthropology, history/art history, conservation/restoration, natural sciences, exact sciences and digital technologies applied to the study of cultural heritage (Figure 1).

This reflection focuses therefore on the advantages of adopting a co-production perspective of scientific knowledge creation, evoking the role of interdisciplinarity, more than just the multidisciplinary interaction. It is assumed that the value (or even values) of glazed ceramics, in particular tiles, is (also) related to their production technique. For the study of this production-

technological memory, it is therefore considered important to stimulate the interaction between different disciplinary fields/sciences in and for the construction of scientific knowledge. With the aim to highlight the impact of using this common effort, real examples of the performed work are provided. From an anthropological approach, it focuses on the contribution that qualitative methodologies have in the deepening of scientific knowledge about materials, production processes, creation, application, and correspondent technological knowledge involved – and which are not necessarily scientific. It is demonstrated how this effort has contributed to reconstruct part of the intangible heritage associated with such ceramic materials – production techniques, knowledge, tools, materials – also highlighting related socio-cultural aspects. It is evidenced the contribution of history/art history to contextualize moments and formulate hypotheses that will help natural/exact and conservation scientists to break new grounds/blazing trails for obtaining scientific knowledge, namely from the study of the materials and its relationship with technical (non-scientific) production know-how.

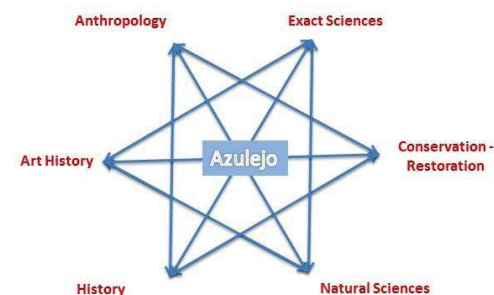


Figure 1. Co-producing scientific knowledge.

Along with the potentialities and achievements of co-production, some of the challenges and opportunities of knowledge are also discussed, reflection to be even more instigated having in consideration the novel resources brought by digital technologies. The heritage – tangible and intangible – related to the industrial production of glazed ceramics in Portugal, is the historical, geographical and cultural context of reference. Where, despite the general recognition of the importance of technological processes in the studies of ceramic heritage, and the many advances in this field of knowledge in recent years, much remains still to be known, along with the imminent vulnerability of this material and immaterial heritage. Gaps in scientific knowledge about the origin of material components, compositions, procedures, techniques and solutions used are still existent, together with a lack of documentation, since much of this technical knowledge has been obtained and transmitted, generally, verbally and by observation.

For the development of the present work, we resort to specialized literature (historical, methodological, sociocultural, from exact and natural sciences, conservation and restoration, etc.), and to studies based on research projects in which the authors participated. Examples are highlighted for instance where the subject of study has been instigated by history/art history, exact/natural sciences, conservation/restoration or social/anthropological questions, and the methods to address those issues also involved those disciplines.



This synergetic interdisciplinarity was observed during the collection and analysis of the materials to study (through laboratory studies, *in situ* observation), historical and documental research, oral narratives (through interviews), imagery and audiovisual (through observation and recording in *situ*, consultation in physical and online archives). This reflection aims therefore to highlight the potential of co-production of scientific knowledge, also emphasizing and valuing the heritage underlying the technological memory associated with the production of glazed ceramics.

Acknowledgment

This work was developed within the scope of the following research projects and programs: 1) P2I Ceramic – Study and Conservation of ceramic materials; 2) Research Program Integrated Methods for the Conservation and Rehabilitation of Built Heritage – MICR of the Research and Innovation Strategy (E2I) of LNEC 2021-2027. Fundação para a Ciência e Tecnologia is acknowledged for the financing of “Old azulejos through new lenses” project (DOI 10.54499/2021.01998.CEECIND/CP1703/CT0001).

Bibliographic references

¹ PEREIRA, S.; Menezes, M.; Lookeren, K. V. – *The importance of technological knowledge for the valorization of azulejo heritage*. In: Menezes, M.; Costa, D.; Rodrigues, J. D. (Eds.) Proceedings IMArTe2017- Intangibility Matters - International conference on the values of tangible heritage. Lisbon, May 29-30. Lisbon: LNEC, 2017, pp. 55-66. http://www.iperionch.eu/wp-content/uploads/2019/04/IMArTe2017_Proceedings.pdf

Challenges in developing a qualitative approach on the perception of tiles decay

Marluci Menezes

LNEC, Lisbon, Portugal, marluci@lnec.pt

Sílvia R. M. Pereira

LNEC, Lisbon, Portugal, spereira@lnec.pt

SUMMARY: Among the objectives of the “Old azulejos through new lenses” and “P2I Ceramic” projects, is the aim to understand the perception and information that owners, managers and/or other relevant personalities have about the probable causes of the deterioration of tile panels. That is, how the responsible for the objects perceive the probable causes of the tiles deterioration. On the other hand, they aim to obtain information about the importance that these interlocutors attribute to the tiles under their tutelage or supervision and to the need to adopt preventive conservation and restoration actions to protect them. This instigated the establishment of a dialogue between the sciences that have traditionally studied the deterioration and conservation-restoration of tiles (exact sciences, construction industry, conservation sciences) and the social sciences. The purpose of this work is, from the perspective of the social sciences, to highlight the potential of this interdisciplinary perspective for the study of tile deterioration. In addition to the challenges that arise, the objective is also to highlight the contribution that a qualitative approach to the study can have to the process of construction and innovation of scientific knowledge, considering, in parallel, the contribution to the field of conservation and restoration of tiles heritage.

KEY-WORDS: Tile decay; Conservation; Safeguarding; Heritage; Memory; Meaning and value.

Focusing on studying historic tiles to contribute to their safeguarding, the “Old azulejos through new lenses” and “P2I Ceramic” projects aim to develop methodologies for collecting, acquiring and recording information (history, constitution and state of conservation), for the analysis and monitoring of the deterioration state of tiles that will enable more effective, efficient and conscious action of their safeguard. However, all the possible causes that provoke the deterioration of these tiles cannot, or can be easily, captured through technical and scientific studies, because certain contextual conditions of the use and architectural environments where these tiles are inserted may have also played a role in their deterioration.

One of the objectives of the projects is to investigate these aspects based on the perception that owners, managers and/or similar personalities make of the probable causes of deterioration of tiles. That is, it is intended to capture how these interlocutors perceive [1] the conditions of construction, use and maintenance of the spaces in which these tiles are located, the knowledge of previous occurrences (such as flooding and water infiltrations) and to identify what they point out as likely contributions to deterioration (Figures 1 – 3).

However, it is also important to better understand the importance (meaning and values) that these interlocutors attribute to the tiles under study, because this aspect also interferes with the extent of care that is or can be taken by preventive conservation and the possibility and type of restoration