

A Case Study Of Student Inventory Practices At The Building Of The 4th Secondary School In Łódź



D.Sc.

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The article delineates the trajectory and significance of student internships integral to the subject "Inventory of Masonry Buildings" within the framework of first-cycle architecture studies, specifically during the fourth semester.

Architectural studies in Poland grant graduates the title of engineer. During their studies, despite engineering subjects, students also gain knowledge in various artistic subjects, subjects that stimulate creativity, as well as general knowledge and theoretical subjects, such as history or theory of architecture. However, in addition to the education mentioned above, a very important core curriculum is also the use of the acquired knowledge in practice [1].

At the Lodz University of Technology, at the Faculty of Construction, Architecture and Environmental Engineering, during first-cycle Architecture studies, both studies in Polish and English, as part of the 4th semester of studies, students choose one of two elective subjects related to practical classes: Architectural inventory of facilities brick or Architectural inventory of wooden structures. This article describes the experience in the subject Architectural inventory of brick buildings, in the academic year 2021/2022 and in the academic year 2022/2023 (fig. 1), and also presents a brief historical outline of student internships carried out as part of the

mentioned subject conducted at the Department of History of Architecture, Revitalization and Conservation of Monuments.

The primary scientific goal of this article is to document and analyze the experiences and outcomes of architectural inventory internships undertaken by students at the Lodz University of Technology. It explores the practical application of theoretical knowledge gained during architectural studies, particularly in the context of measuring and documenting brick buildings. By focusing on the specific case study of the inventory of the 4th General High School in Łódź, the article aims to provide insights into the methodologies, challenges, and benefits associated with such fieldwork. Furthermore, the article delves into the historical background of the surveyed building, offering contextual understanding of its architectural significance and evolution over time. Through detailed descriptions of the measurement process, including equipment usage and data collection techniques, the article aims to elucidate the intricacies involved in architectural inventory practices. Moreover, the article evaluates the

pedagogical value of internships in architectural education, emphasizing their role in bridging the gap between theoretical learning and real-world application. It discusses the transformative impact of field-work experiences on students' professional development, highlighting the acquisition of both technical skills and soft skills essential for future architectural practice. In addition, the article underscores the broader implications of architectural inventory studies beyond academia, emphasizing their relevance for urban planning, heritage preservation, and architectural conservation efforts. By drawing connections between student internships and broader societal needs, the article advocates for the integration of practical experiences into architectural curricula, ultimately shaping the future generation of architects.

In this article, several scientific methods are employed to document and analyze the experiences and outcomes of architectural inventory internships:

- **Descriptive Analysis:** The article provides detailed descriptions of the architectural inventory process, including equipment usage, data collection techniques, and the structure of the measured building. It outlines the specific tasks performed by students during the inventory, such as measuring walls, door and window openings, ceilings, balconies, roof trusses, and architectural details.
- **Observational Studies:** Students engage in observational studies as they measure and document the building. They make observations about the physical characteristics, layout, and condition of the building, which are essential for creating accurate inventory documentation.
- **Historical Analysis:** The article includes a historical analysis of the surveyed building, offering insights into its architectural significance, evolution over time, and historical context. This historical background adds depth to the understanding of the building's architectural features and informs the inventory process.
- **Quantitative Analysis:** Quantitative analysis is employed during the measurement process, where students use measuring tapes, rangefinders, staffs, and rulers to obtain precise measurements of various building elements. Measurements are recorded systematically and accurately to ensure the reliability of the inventory data.
- **Qualitative Analysis:** Qualitative analysis is conducted through student surveys, which assess the course of the internship and its benefits for further architectural development. Students provide qualitative feedback on their experiences, including the practical skills gained,



Fig. 1. Students of 2021/2022, first day of internship, at the building of the 4th Secondary School in Łódź; source: author – Antonio Nevescanin



Fig. 2. Students of 2022/2023 measuring the facade in the courtyard of the 4th Secondary School in Łódź; source: author – Antonio Nevescanin





Fig. 3. Location of the building of the 4th Secondary School in Łódź and division of the inventory into two years, yellow color in 2022, red color inventory in 2023; source: intersit + authors' own work.



Fig. 4. Southern façade of the 4th Secondary School building; source: author – Antonio Nevescanin

support received from instructors, and the overall value of the internship.

- **Advocacy and Augmentation:** The article advocates for the integration of practical experiences, such as internships, into architectural curricula based on the broader implications of architectural inventory studies for urban planning, heritage preservation, and architectural conservation efforts. It presents arguments supported by evidence to emphasize the importance of practical experiences in shaping the future generation of architects.

Architectural inventory of masonry buildings

Within the framework of architectural education at Lodz University of Technology, first-cycle architecture students participate in internships focused on the measurement and inventory of brick buildings (fig. 2), as part of elective coursework. This practical engagement occurs during the fourth semester of their studies. Preceding the commencement of internships, students are provided with an introductory lecture elucidating the fundamental principles and methodologies underpinning architectural inventory practices, with a specific emphasis on brick constructions. Occupational health and safety protocols pertinent to the conduct of architectural inventories, particularly within the context of existing and historical brick edifices, are comprehensively discussed.

The internship endeavours undertaken by students aim at the creation of reconstruction documentation, both in tangible paper formats and digitally, for extant buildings lacking comprehensive or partial technical documentation. Students, organized into groups of three, undertake measurements encompassing various architectural elements, including walls, door and window openings, ceilings, balconies, roof trusses, and intricate architectural details. The initial sketches derived from these inventories provide foundational data pertaining to room layouts, wall dimensions, load-bearing structures, facade appearances, floor counts, extant joinery, and installations. The ensuing documentation produced during the summer internships encompasses a descriptive component delineating technical specifications, alongside an array of drawings such as floor plans, facade elevations, cross-sections, and architectural details, from scale 1:100 up to the scale of 1:20 for architectural details. Photographic documentation, facilitated by measuring tape or staff, supplements the architectural inventory by providing visual context. The measurement scope spans dimensions including length, wall thickness, room height, window sills, beams, door and window opening sizes and locations,

recesses, and ventilation grilles, among others. Measurement tools employed by students include measuring tapes, rangefinders, staffs, and rulers, alongside methodologies grounded in photogrammetric and photography. All measurements are executed from ground level.

Internships are scheduled during the summer recess following the examination session. Students are tasked with the meticulous measurement, sketching, plotting, and photographing of selected brick buildings over a duration of two weeks. The culmination of these efforts yields a comprehensive array of drawings, photographs, and technical documentation for the inventoried structure. The technical drawings encompass plans of individual floors, roof truss diagrams, at least two cross-sections, and elevations of all facades. A structured approach is advocated during the sketching and note-taking processes, emphasizing adherence to proper measurement sequences and room designation conventions. The creation of inventory drawings entails a meticulous understanding of room configurations, followed by measurement and annotation procedures. Utilization of coloured markers facilitates clarity in drawing presentation, ensuring precise depiction of measured dimensions. Hand-drawn sketches or notes serve as accurate representations of measured spaces, designed to approximate scale and proportion. Adequate space allocation on sketches facilitates the clear inscription of dimensions.

The fundamental equipment required for inventory execution includes retractable measuring tapes, foldable rulers and long-distance rangefinders. Optimal efficiency is achieved through the collaboration of a three-person team, with designated roles for measurement, recording, and verification. Measurement procedures necessitate stationary tape placement, parallel alignment with measured elements, and consistent tension maintenance to prevent distortion. Geometric properties of rooms are discerned through diagonal measurements, with comprehensive room shape assessments to mitigate errors associated with piecemeal measurement aggregation. Data recording on sketches involves sequential inscription along continuous dimension lines, delineated by directional indicators denoting measurement commencement and conclusion points. Subsequent conversion of measured dimensions into technical drawings necessitates adherence to predefined scales and dimensional standards. Technical descriptions accompanying the architectural inventory serve to contextualize structural attributes, equipment configurations, and pertinent observations not captured within graphical representations. The graphical part, executed at a scale of 1:100 or 1:50,



Fig. 5. Checking the compliance of drawings on test prints during the inventory in 2023; source: author – Antonio Nevescanin



Fig. 7. Creation of technical documentation during the inventory in 2023, in the building IV LO; source: author – Antonio Nevescanin

following consultation with the internship supervisors, includes: a site plan of the plot with the location of the building and neighbouring buildings, prepared on a geodetic basis with a situation and height, developed by one of the groups of students. In this drawing, we mark the plot's fence. Arrows mark the main entrances to the building and the entrance to the property. Other elements are marked, such as: greenery, surfaces, farm buildings, and area lighting. The number of storeys is marked in circles on the building. The most important part of the inventory documentation are horizontal projections of all floors, roof trusses, roof slopes (hypothetical drawing on a sketch scale), vertical sections, views of all facades, and architectural details. Each drawing is provided with



Fig. 6. Measurement of the facade and gate using a staff, inventory in 2022; source: author – Antonio Nevescanin



Fig. 8. Student sketch of a door joinery detail, inventory in 2023; source: student study

a table specifying the area of the rooms, and the drawing table is placed in the lower right corner of the drawing field. Each drawing is accompanied by a tabular enumeration of room areas, facilitating comprehensive spatial analysis. Photographic documentation supplements graphical representations, providing visual context and contextualizing measurement data within the broader architectural context. The meticulous creation of technical drawings adheres to predefined formats, scales, and content specifications, ensuring consistency and accuracy across all documentation components. Electronic and paper-based formats of the documentation are archived for subsequent reference and academic evaluation. The scope of the documentation for a masonry building includes



technical drawings in agreed-upon quantities and scales (formats: dwg, pdf 300 dpi in greyscale (with layers and flattened), tif 300 dpi in greyscale.), photographic documentation, technical description, working drawings (so-called field notes on appropriate forms). Paper versions of the works are placed in A3 folders along with the electronic version recorded on CD/DVD discs.

The systematic execution of architectural inventory internships represents a cornerstone of pedagogical excellence within architectural education. Through practical engagement, students develop foundational skills in measurement, documentation, and analysis, underpinned by theoretical knowledge. The iterative refinement of methodologies, procedural adherence, and collaborative teamwork foster a culture of excellence, preparing students for the multifaceted challenges of professional architectural practice.

Building of the 4th general high school, at pomorska 16, in Łódź

In the academic years 2021/2022 and 2022/2023, the architectural focus for measurement and inventory documentation was the edifice housing the 4th Secondary School situated at 16 Pomorska Street in Łódź. Positioned centrally within the city, adjacent to residential and commercial developments, it stands proximate to significant urban landmarks such as Piotrkowska Street and Freedom Square (fig. 3). The contract was signed between the school board and the Institute of Architecture and Urban Planning.

The 4th Secondary School building, erected on plot number 188/5, is a four-story structure with a basement, accessible from Pomorska Street. Originally constructed in 1903, it exemplifies Neo-Renaissance architectural style (fig. 4) and was envisioned by Franciszek Chęłmiński, an esteemed architect of Łódź [2]. Historically, the site occupied by the 4th Secondary School bore plans for a synagogue during the latter half of the 19th century. However, municipal authorities redirected its purpose, leading to the establishment of two Russian-speaking junior high schools in 1886 [3]. The building at 16 Pomorska Street, serving as a school for girls, commenced operations in 1903, alongside a counterpart facility on Sienkiewicza Street. Initially, the former operated from a different location before relocating to its current address [4]. Notably, the student body primarily comprised girls from affluent Russian families. The architectural composition of the high school building mirrors design principles employed in the construction of the male junior high school at 46 Sienkiewicza Street. Noteworthy elements include a distinctive layout of corridors and

rooms, coupled with provision for teacher residences. A front-facing metal fence, delineating the school grounds from the street, accentuates the architectural ensemble [5]. During the German occupation in 1915, the building transitioned into a Soldiers' Home, hosting civic gatherings and municipal meetings in its auditorium. Post-1920, the premises served as the State Girls' Secondary School No. 39, named in honour of Emilia Szczeniacka, marking a significant milestone in Polish girls' educational history within Łódź. The architectural narrative of the 4th Secondary School embodies a fusion of historical significance, urban centrality, and pedagogical evolution. Its Neo-Renaissance aesthetic, intertwined with socio-historical contextualization, underscores its enduring legacy within the architectural tapestry of Łódź. Through meticulous measurement and documentation, the edifice's architectural heritage and cultural resonance are perpetuated, enriching academic discourse and urban historiography alike.

Inventory of the 4th general high school in Łódź

The school facility under scrutiny, inventoried during the academic years 2021/2022 and 2022/2023, is characterized by a conventional solid brick construction. Ceilings predominantly feature flat concrete supported by steel beams, although sectional ceilings are evident in select areas. Access to the edifice is facilitated through a single entrance situated on the frontal street, specifically in the southern façade. Notably, external access to the basement is accessible from the primary courtyard, with an additional entrance in the annex located within the secondary courtyard. The architectural configuration comprises two staircases constructed using steel beams and brickwork, with the facility spanning three above-ground floors and a basement level. Symmetrically planned, the layout adopts the shape of the letter 'H', with supplementary annexes incorporating independent staircases and interconnected at the first-floor level. External fixtures such as door joinery and entrance gates are predominantly wooden, characterized by double-leaf and single-leaf doors, with window joinery following a similar wooden framework.

Owing to the structural complexity and architectural intricacies inherent to the facility, the inventory process was subdivided over two years of practical engagement (fig. 3). In the initial phase, emphasis was placed on measuring the front portion of the building and the connecting sections, followed by the inventory of annexes in the subsequent year. Each phase enlisted approximately 90 students tasked with measurements and documentation. Internships spanned two

weeks, operating during standard working hours from Monday to Friday, under the supervision of academic faculty and departmental staff specializing in architectural history, conservation, and revitalization. Over the two-year inventory cycle, students from the Lodz University of Technology were systematically introduced to the intricacies of preparing technical and architectural documentation, encompassing measurement methodologies specific to brick constructions and traditional building technologies. Organized into teams of three, students were assigned diverse tasks encompassing floor plans, cross-sections, façade drawings, and detailed schematics of door and window joinery, among others. Notably, a coordination team was entrusted with amalgamating individual drawings and ensuring coherence across the entire documentation suite (fig. 5). During the internship, the initial week was predominantly dedicated to measurement and sketching endeavours, serving as the foundational basis for subsequent technical drafting [fig.6]. Utilizing a blend of traditional measurement tools and contemporary laser rangefinders, students meticulously captured spatial dimensions and architectural features. The latter week witnessed a transition to on-site computer-aided drafting (CAD) operations (fig. 7, fig. 8), enabling students to refine technical drawings with enhanced precision and flexibility. Furthermore, this phase facilitated hands-on learning in computer-aided design (CAD) techniques, fostering proficiency and adaptability among participants.

Following the internship, students underwent a comprehensive assessment process, involving both qualitative feedback and quantitative survey responses. The unanimous consensus among students underscored the instrumental role of the internship in their professional development within the architectural domain. Noteworthy was the pervasive mentorship provided by supervisory staff, offering guidance and support throughout the duration of the internship. Additionally, the incorporation of feedback mechanisms ensured continual refinement of individual and collective performance, culminating in a comprehensive evaluation encompassing the entirety of the cohort's efforts.

Conclusion

Internships serve as a pivotal bridge between academic learning and real-world application, offering aspiring architects invaluable experiential learning opportunities. Among these, inventory internships stand out as a cornerstone experience, providing students with their initial exposure to the multifaceted role of an architect. Unlike the sometimes abstract challenges encountered in university settings, inventory internships offer a tangible connection between

theoretical knowledge and practical implementation. Participating in inventory internships immerses students in the complexities of architectural documentation and conservation practices, instilling a deeper understanding of the discipline. By engaging with real-world projects, students gain insight into the intricate processes involved in preserving architectural heritage. This hands-on experience not only enhances their technical skills but also fosters the development of critical soft skills such as teamwork, communication, and problem-solving [6]. Furthermore, working on historical buildings presents students with unique challenges and opportunities. It allows them to apply theoretical concepts learned in lectures to real-world scenarios, thereby reinforcing their academic knowledge [7, 8]. Additionally, the historical significance of these structures adds an extra layer of complexity, requiring students to consider factors such as cultural heritage, preservation ethics, and adaptive reuse strategies.

The documentation produced during inventory internships serves as a valuable resource for various stakeholders beyond the academic realm. City officials, preservation organizations, and private investors rely on this documentation to inform decision-making processes related to renovation, restoration, and heritage conservation projects. The comprehensive data collected by students not only contributes to the preservation of architectural heritage but also facilitates informed urban planning and development initiatives. Moreover, the insights gained from inventory studies often inspire students to pursue further research and project work in the field of architectural conservation. Topics explored during internships may serve as the foundation for future project classes and diploma theses, enriching the academic discourse and contributing to the advancement of the discipline.

In essence, student internships play a vital role in shaping the future generation of architects by bridging the gap between academia and professional practice. The reciprocal relationship between education and practical application underscores the symbiotic nature of these experiences, highlighting their enduring impact on both individual career trajectories and the broader architectural landscape.

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PRAWIDŁOWY SPOSÓB CYTOWANIA

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ABSTRACT:

The article delineates the trajectory and significance of student internships integral to the subject "Inventory of Masonry Buildings" within the framework of first-cycle architecture studies, specifically during the fourth semester. This mandatory component of the curriculum unfolded in the field, post the conclusion of the summer semester, immersing students in an authentic historical site. Throughout the two-week internship period, students collaborated with faculty to conduct comprehensive measurements and compile exhaustive inventory documentation. This immersive experience guided them through all phases of developing project documentation. The intrinsic value of such hands-on engagement is paramount for students as it exposes them, for the first time in their academic journey, to a challenge rooted in tangible, real-world scenarios rather than abstract concepts. Moreover, the focus on a historical building during the undergraduate phase lays a robust foundation for comprehending historical subjects in their studies. The practical involvement in the documentation and preservation process also serves as a cornerstone for subsequent coursework related to conservation and architectural heritage. This integration of theoretical knowledge with practical application enhances the students' overall learning experience, fostering a deeper understanding of architectural principles and historical contexts.

KEYWORDS:

student internships, teaching architecture, pedagogy, architecture studium, fieldwork classes

STRESZCZENIE:

STUDIUM PRZYPADKU STUDENCKICH PRAKTYK INWENTARYZACYJNYCH PRZY BUDYNKU IV LO W ŁODZI. Artykuł opisuje przebieg i znaczenie praktyk studenckich integralnych z przedmiotem inwentaryzacja budynków murowanych w ramach studiów architektonicznych I stopnia, a konkretnie w semestrze czwartym. Ten obowiązkowy element programu nauczania realizowany jest w terenie po zakończeniu semestru

letniego na rzeczywistym obiekcie historycznym. Przez cały dwutygodniowy okres praktyk studenci współpracowali z wykładowcami w celu przeprowadzenia kompleksowych pomiarów i opracowania wyczerpującej dokumentacji inwentaryzacyjnej. To wciągające doświadczenie poprowadziło ich przez wszystkie fazy tworzenia dokumentacji projektowej. Wartość takiego praktycznego zaangażowania jest dla studentów bardzo ważna, ponieważ po raz pierwszy w ich akademickiej podróży wystawia ich na wyzwanie zakorzenione w namacalnych, rzeczywistych scenariuszach, a nie w abstrakcyjnych koncepcjach. Co więcej, skupienie się na budynku historycznym na etapie studiów inżynierskich stanowi solidną podstawę do zrozumienia przedmiotów historycznych na studiach. Praktyczne zaangażowanie w proces dokumentacji i konserwacji służy również jako podstawa dla późniejszych zajęć związanych z konserwacją i dziedzictwem architektonicznym. Ta integracja wiedzy teoretycznej z praktycznym zastosowaniem zwiększa ogólne doświadczenie edukacyjne uczniów, sprzyjając głębszemu zrozumieniu zasad architektonicznych i kontekstów historycznych.

SŁOWA KLUCZOWE:

praktyki studenckie, kształcenie architektów, pedagogia, studia architektury, zajęcia terenowe