

Tell me what you want: Internships and the demands of the local AEC industry in Brazil

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Abstract

Higher Education courses in Architecture and Urban Design in Brazil are structured by the National Curriculum Guidelines (DCN), which guide the formation of upcoming professionals by means of its Nucleus of Professional Knowledge. Internships offer an important opportunity to mold such young professionals, but reveal a partial compatibility between the local Architecture, Engineering and Construction (AEC) industry and the DCN. Thus, the objective of this research is to verify eventual adherences amongst the demands of the local AEC industry and the DCN's Nucleus of Professional Knowledge. Such analysis was conducted by means of the data collected by web-based forms from architecture and urban design students from School of Civil Engineering, Architecture and Urbanism at Unicamp during the years of 2021 and 2022. Results show that the Nucleus of Professional Knowledge in the DCN partially reflects the demands of the local AEC industry. This paper's contributions align the major towards the industry's necessities.

Keywords: Undergraduate Education; Architecture and Urban Design; Job Market; Professional competences.

1. Introduction

The undergraduate major in Architecture and Urban Design in School of Civil Engineering, Architecture and Urban Design (FECFAU) at University of Campinas (UNICAMP) is a six-year nocturnal course. It has the second highest entrance rate in UNICAMP after the Medicine major, with 83 students per academic spot in the entrance exam's first phase (COMVEST, 2023), accepting only 30 students per year. The major is constituted by a total of 4650 hours which are spread in a total 305 credits, which last 6 years to complete (Diretoria Acadêmica, 2022). Each credit at UNICAMP is composed of 50 minutes worth of class time, which can be both theoretical and practical.

In order to enroll in the Architectural and Urban Design Internship course within the referred major, a student needs to have at least 30% of all the course credits completed. The internships can take up between 20 and 30 hours of the student's week according to the updated internship regulations of Architecture and Urban Design in UNICAMP's FECFAU.

Usually, such internships courses in both private and public institutions in Brazil are purely bureaucratic, verifying the internship documents and forwarding them to compute as credits for the students graduation. The absorption of the knowledge extracted from the internships is hindered by the inflexibility of the hiring companies regarding academic deadlines, as well as the understanding of internship as a production rather than a learning endeavor, bolstering the bureaucratic nature of the internship disciplines (Muniz & Loureiro, 2018).

There is a concern regarding the nature of architectural internships filling eventual gaps in constructive components of architectural education in Brazil (Fabricio & Melhado, 2007), mostly due to the lack of infrastructure in local private universities regarding construction sites. However, the myriad of possibilities of professional ventures by interns makes it so seldomly students are able to fulfill this gap, and institutes a growing distancing between incoming architects and urban designers and effective construction experience (Muniz & Loureiro, 2018).

Within this context, this research presents a panorama of the architectural internship within the undergraduate degree in Architecture and Urban Design in FECFAU (School of Civil Engineering and Architecture and Urban Design) from UNICAMP (Campinas State University), nearby São Paulo, Brazil, within the years of 2021 and 2022. From the aforementioned panorama, this article aims to evaluate eventual adherences amongst the demands of the local AEC industry and the National Curriculum Guidelines' Nucleus of Professional Knowledge (*Diretrizes Curriculares Nacionais* - DCN) (RESOLUÇÃO N° 2, DE 17 DE JUNHO DE 2010, 2010). This research is based on the students' reports within the internship course, which reveal the demands of the local AEC industry by means of the tasks and skills required of the undergraduates.

The proposed analysis has the potential of academic contributions regarding future curriculum restructuring and reflections within FECFAU UNICAMP, which in turn could be absorbed by neighboring institutions nationwide. Furthermore, there is a prospect of social

and technological contributions referring to the alignment of upcoming laborers' skill set and the industry. Such contributions could assist the tackling of the nation's explicit architectural issues and promote employment opportunities both at home and abroad.

2.Literature Review

Internships in Brazil are commanded by the Law N° 11.11.778/2008 (LEI N° 11.788, DE 25 DE SETEMBRO DE 2008, 2008), which defines internship as “[...] educational act, supervised, developed in a work site, which aims to prepare undergraduate [...] students for professional activities” (p. 1). According to this particular piece of legislation, there are both mandatory and non-mandatory internship opportunities. Mandatory internships count towards graduation credits and non-mandatory internships are optional aiming for furthering the academic and professional background of students. Also, it emphasizes the empowering of the learning aspects intrinsic to architectural opportunities.

The Council of Architects and Urban Designers of Brazil (Conselho de Arquitetura e Urbanismo - CAU) does not institute guidelines for internships relating to the profession. It only institutes the professional competences to be held by architects and urban designers. Those competencies are then transformed into curriculum guidelines by the Ministry of Education (MEC) by means of the DCN (2010).

The National Curriculum Guidelines (*Diretrizes Curriculares Nacionais - DCN*) (RESOLUÇÃO N° 2, DE 17 DE JUNHO DE 2010, 2010) for Architecture and Urban Design undergraduate majors in Brazil are established by the MEC as a statute to assure the quality of the major offered in both public and private schools throughout Brazil. There is an ever-growing number of higher-degree institutions that offer the course throughout Brazil, growing from 466 courses in 2015 to 936 courses in 2023 (Ministério da Educação - MEC, 2023).

The DCN (RESOLUÇÃO N° 2, DE 17 DE JUNHO DE 2010, 2010) establishes that schools of architecture and urban design in Brazil are to be able to form upcoming professionals of generalist nature, capable of comprehending and translating the necessities of individuals, social groups and communities when it comes to the conception, the organization, and the construction of interior and exterior spaces, encompassing urban design, aligned with the Law of Guidelines and Bases for National Education (LEI N° 9.394, DE 20 DE DEZEMBRO DE 1996, 1996), which states explicitly that universities must establish a connection between curriculum and practical life and produce qualified labor resources.

When it comes to internships, the DCN (RESOLUÇÃO N° 2, DE 17 DE JUNHO DE 2010, 2010) proposes that schools conceive and organize supervised internship opportunities encompassing different forms of student participation. The architectural internship credits are to be completed in an “internship discipline” per se, in a manner as to assure the consolidation and articulation of the professional competences deemed essential by the DCN: habitability of spaces, social usage of construction technology, sustainability, architectural heritage, all in a generalist perspective (RESOLUÇÃO N° 2, DE 17 DE JUNHO DE 2010, 2010).

The professional characterization of future architects in the DCN is overseen by its Nucleus of Professional Knowledge (RESOLUÇÃO N° 2, DE 17 DE JUNHO DE 2010, 2010). Such nucleus is orchestrated by the following segments: Theory and History of Architecture, Urbanism, and Landscape Architecture; Architecture, Urbanism, and Landscape Architecture Design; Urban and Regional Planning; Construction Technology; Structural Systems; Environmental Comfort; Architectural Heritage; Information Technology Applied to Architecture and Urbanism; and Topography.

3. Method

This research could be classified as a descriptive-explicative investigation (Gil, 2009). Academic researches of descriptive nature aim for the description of the characteristics of a given population or phenomenon, or the establishment of relationships amongst variables, whereas investigations of descriptive-explicative nature go beyond the simple investigation of the existence of relationship between variables, and aim to determine the nature of this relationship (Gil, 2009).

The proposed method for this article starts with the “data input”, originated from the course of Architectural Internship in UNICAMP’s FECFAU, whereas the main source of data was the student’s internship final report - collected from students coming from the courses of 2021 and 2022. The second methodological step of this research was the “information processing”, where the data from the students’ internship reports gathered initially was filtered and graphically processed (Figure 1).

Afterwards, such data was thoroughly analyzed, and as results there was obtained a panorama of the Architectural Internships at FECFAU-UNICAMP. Another result of this analysis was the establishment of the demands of the local industry. This conclusion was then forwarded to the discussion to finally evaluate adherences amongst the local AEC industry and the National Curriculum Guidelines’ Nucleus of Professional Knowledge (Figure 1).

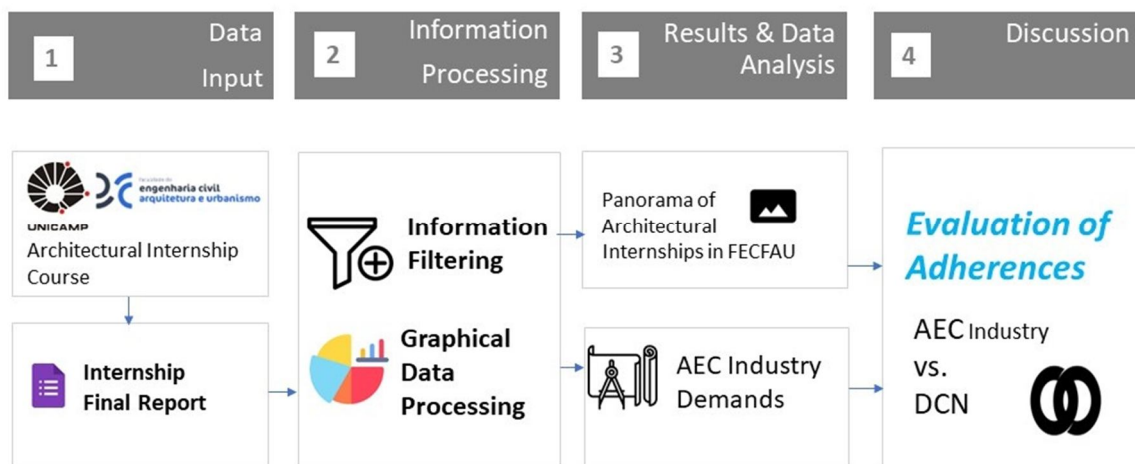


Figure 1: Methodological Synthesis of the Research.

4. Results and Data Analysis

In this session there are the results of the gatherings of information of the architectural internship courses within the undergraduate degree in Architecture and Urban Design program in FECFAU from UNICAMP, nearby São Paulo, Brazil, within the years of 2021 and 2022.

When it comes to the students' internship experience, most students engage in internships without previous experiences (Fig 2a), whereas it was observed that the majority of companies demanded pre-requisites for the interns aspiring for the jobs (Fig 2b). However, it was found that few of the hiring firms offered training to the incoming students regarding these solicited skills (Fig. 1c).

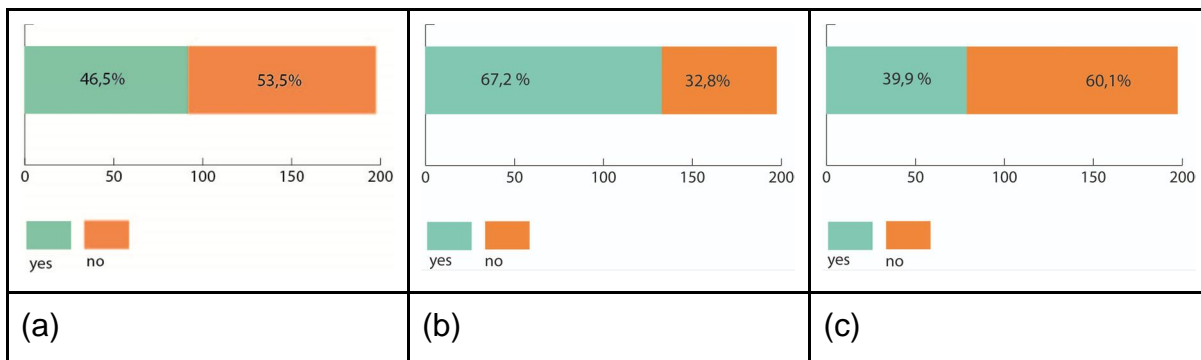


Figure 2: (a) Experience prior to internship; (b) Pre-requisites required of the candidate; (c) Training within-job.

One of the demands of the internship term is the description of the activities to be carried out by the students. Usually, those activities are written in a rather synthesized manner, listing only generic, very comprehensive tasks. Another demand in the internship term is the description of the working conditions, which tend to be very generic, specifying whether the tasks are to happen in or outside the office, or at home. Most of the interns noted that they had proper work conditions for the development of their activities (Fig. 3). Nonetheless, some issues were detected, such as the lack of PCs, related to home-office activities.

The conditions to develop the activities required in architecture and urban design are quite diverse due to the assorted nature of the profession. Thus, such working conditions could very well have been a challenge, especially, in times of home-office internship activity during the pandemic.

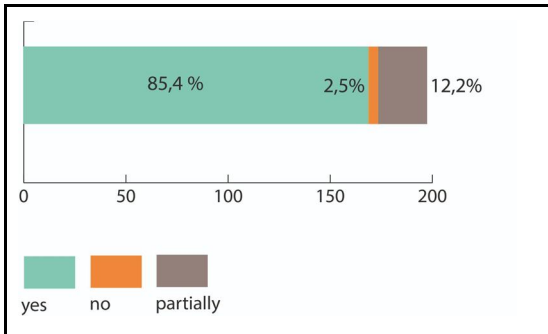


Figure 3: Adequate conditions for interns for the development of their activities

Interns are expected to have prior experience and skills (Fig 2b) in order to obtain other internship opportunities. It is safe to say that the same happens with job opportunities, having new architects and upcoming interns facing ever growing pressure when applying for new positions. This could have students work much more hours in internship than needed (Fig. 4a), since FECFAU’s internship hour toll requirement is only 180 hours (INSTRUÇÃO NORMATIVA CGAU QUE INSTITUI O ESTÁGIO SUPERVISIONADO DO CURSO DE ARQUITETURA E URBANISMO DA FACULDADE DE ENGENHARIA CIVIL, ARQUITETURA E URBANISMO DA UNICAMP, 2022). There is a predominance of paid internship opportunities (Fig. 4b), implying a correlation with the harsh economic conditions of Brazil in the sense that these students might be seeking financial assistance first, and intellectual improvement second. This particular request for financial aid is seen in the author’s experience as teachers in the classroom environment throughout the years. The average wage itself of the interns nears the Brazilian minimum wage (Fig. 4c), but only for a 30-hour week period whereas a regular full-blown Brazilian worker would have to work a 40-hour week to earn such a wage.

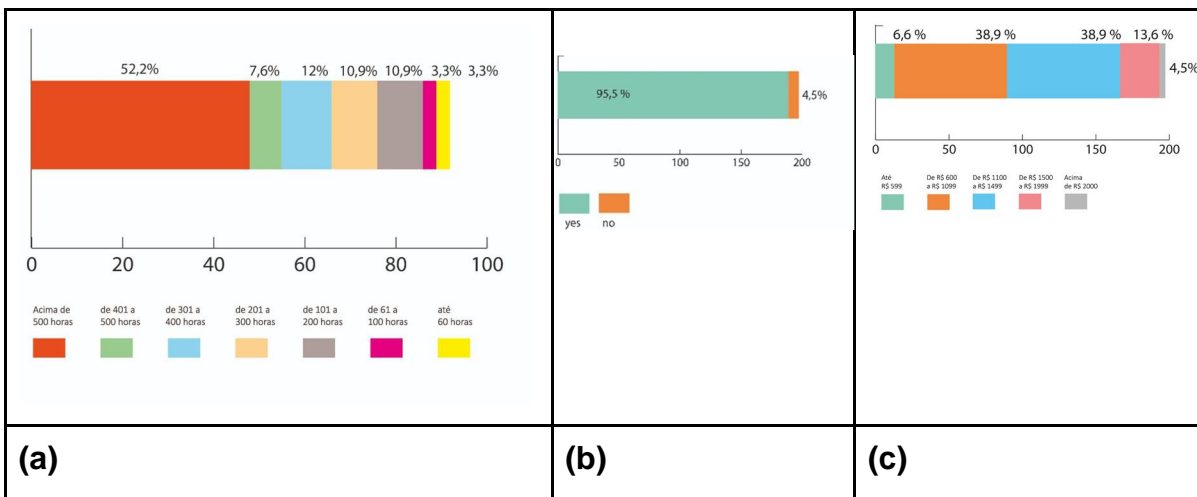


Figure 4: (a) how many hours/week did interns work in earlier internship opportunities; (b) is the internship paid? (c) Average wage of the interns.

Following the aforementioned work-week discussion, most interns have reported working 30 hours a week either in the morning period or in a flexible time-fashion (Fig. 5). This data

concatenates with the nocturnal and demanding nature of FECFAU's Architecture and Urban Design course.

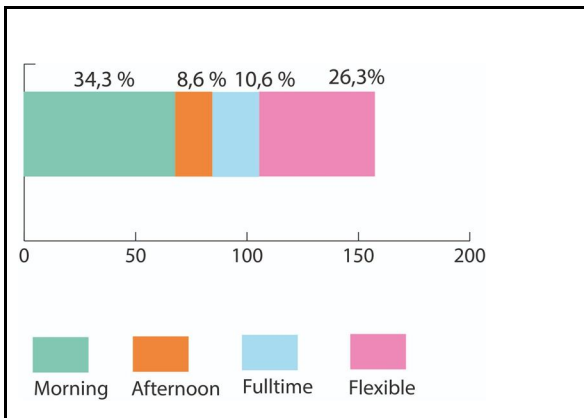


Figure 5: Intern's working shift

Amongst the major benefits offered by hiring companies are transportation aid, life insurance and meal tickets (Fig. 6). However, there is a considerable percentage of businesses who do not assist interns with any benefits. Those benefits are of great importance to students, that way they can save up their stipends for books and/or other eventual academic expenses.

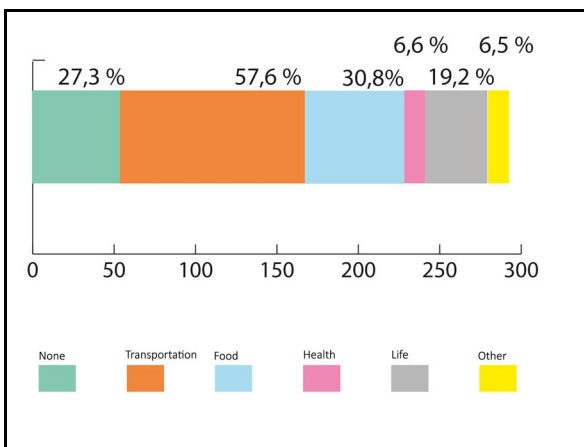


Figure 5: Internship benefits.

When it comes to the location of their internships, students logically preferred Campinas itself (Fig. 6a), with a few occurrences in neighboring towns and the capital Sao Paulo. The neighborhoods concentrated in areas of high business human development index (HDI) such as the Cambuí and the neighboring Barão Geraldo district, near UNICAMP (Fig. 6b).

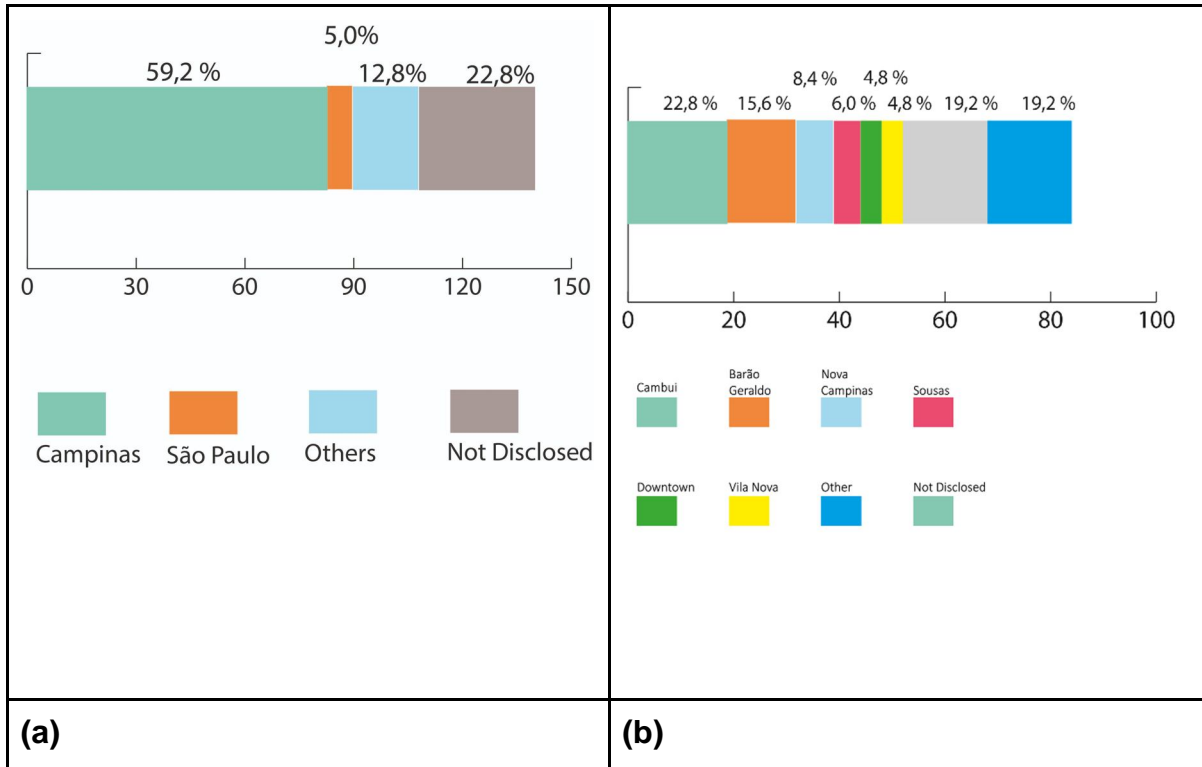


Figure 6: (a) municipal distribution of internships; (b) distribution amongst districts of internships.

Students are looking for opportunities mostly in the same areas, despite the openly broad opportunities that the profession offers (Frazzato, 2016). Students have shown to prefer to work in architectural firms, construction companies, city halls (in the areas of architectural design and urban planning) (Fig. 7).

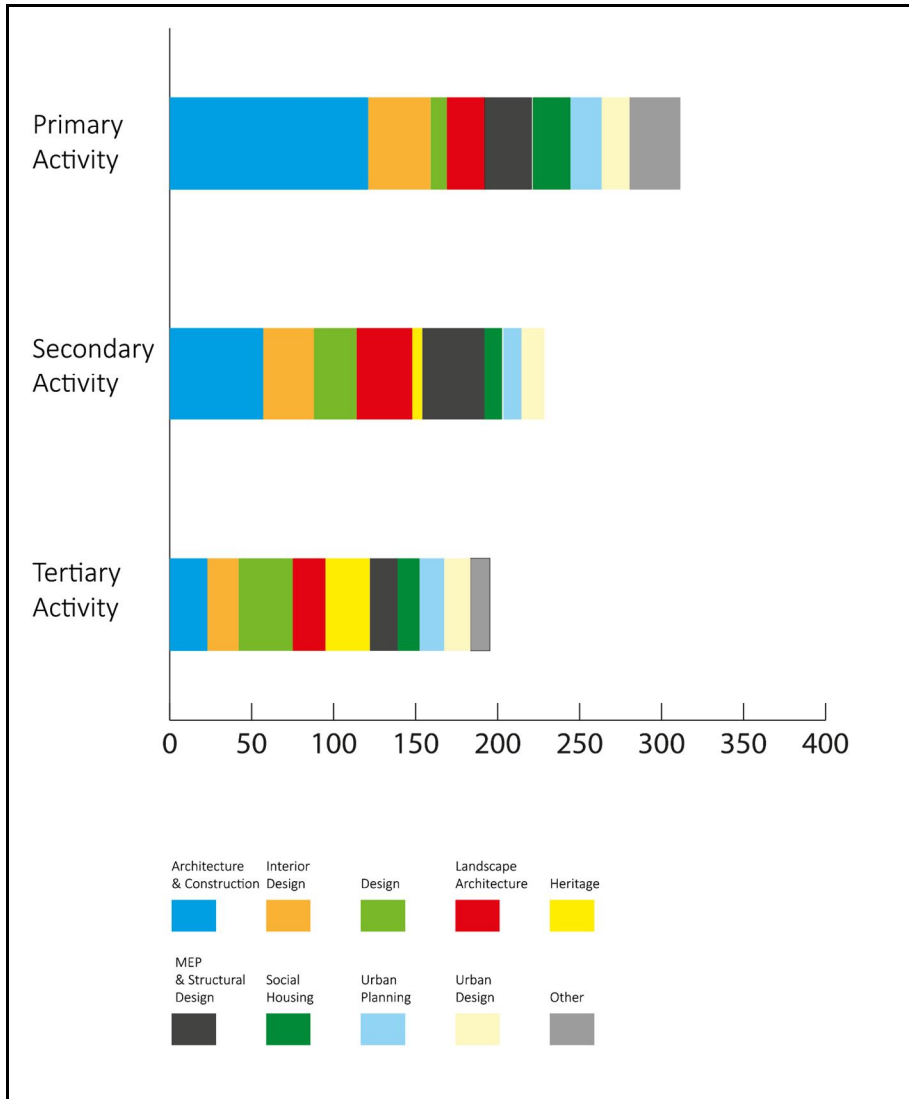


Figure 7: Preferred areas of work within architecture and urban design.

The majority of hiring companies were classified as small (Fig. 8a), with a small contingent of interns ranging from 1 to 3 (Fig 8b), being mostly supervised by an architect and urban designer (Fig. 8c). These experiences were varied regarding direct contact with external clients (Fig. 8d), with interns rendering mixed responses over this issue.

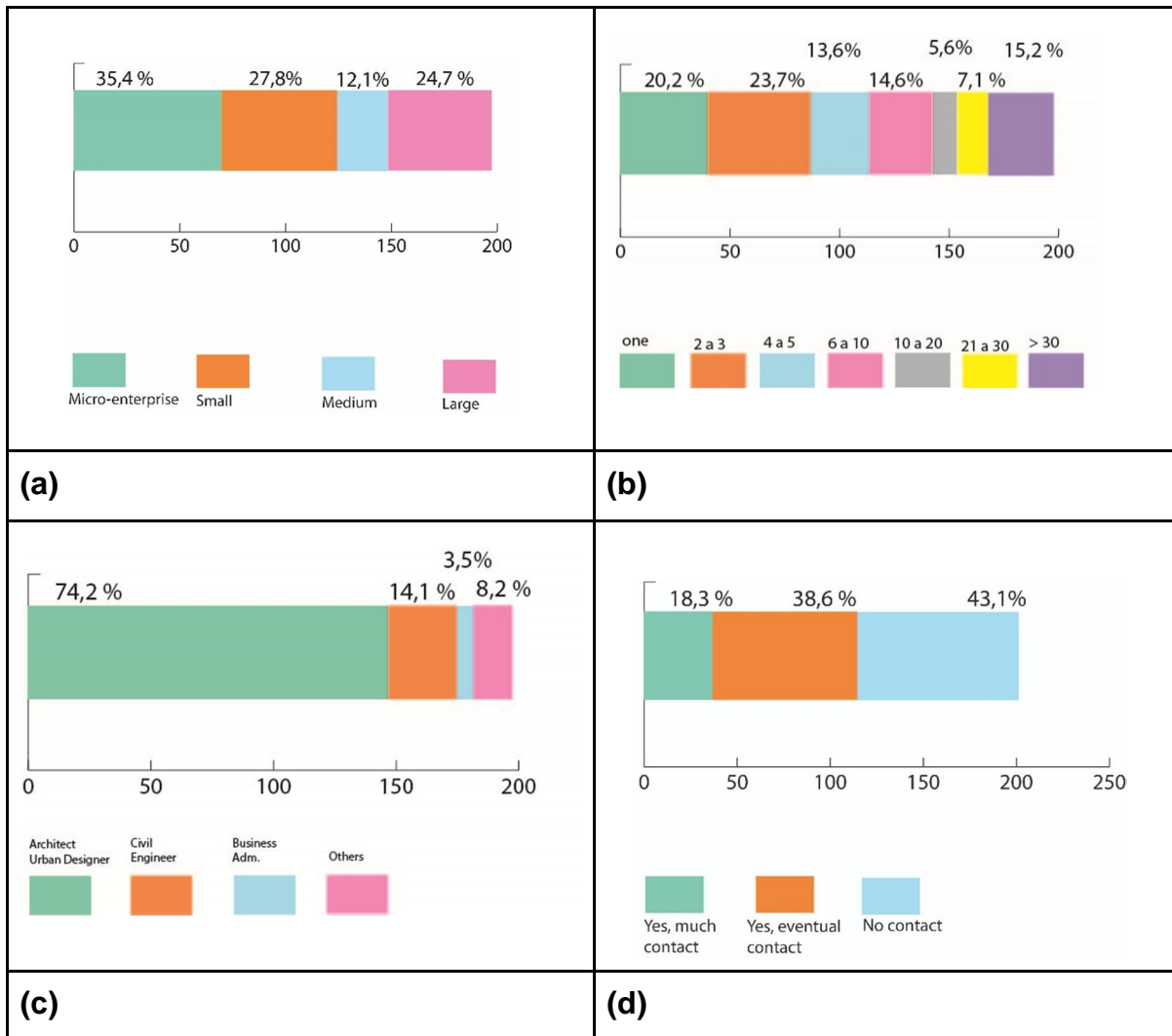


Figure 8: (a) Sizes of companies; (b) quantity of interns; (c) profession of supervisor; (d) contact with clients.

The classroom experience of the authors rendered lasting complaints of students regarding the demanding time-consuming nature of the architecture and urban design course, especially due to its nocturnal period. It appears that the internship's starting and ending times are being honored (Fig. 9), giving away to these claims.

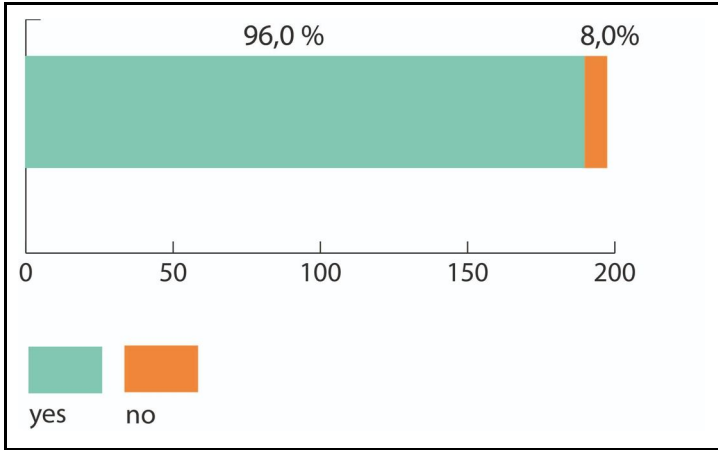


Figure 9: Internship initial and ending time are being respected?

5. Discussion and conclusion

Aiming to assess potential correlations between the requirements of the local AEC industry and the DCN, Table 1 presents the DCN’s Nucleus of Professional Knowledge and the sectors of developed internship amongst the years of 2021 and 2022. However, it is important to note that the internship period is indeed not a job, but a moment of learning and growth of the students. However, the observation of the employers’ demands is an alarm for the market’s implications.

Table 1: Relation between DCNs Nucleus of Professional Knowledge and areas of work within architecture and urban design firms.

DCNs Nucleus of Professional Knowledge	Internship areas within companies
Theory and History of Architecture, of Urbanism, and of Landscape Architecture.	N/A
Architectural Design	Architecture and Construction; Interior Design; Design; Social housing
Urban Design	Urban design
Landscape Architecture	Landscape architecture
Regional and Urban Planning	Urban planning
Construction Technology	N/A

Structural Systems	N/A
Environmental Comfort	Environmental Comfort; Acoustical Comfort
Architectural Heritage	Architectural heritage
Information Technology Applied to Architecture and Urban Design	Building Information Modeling; Draftsmen
Topography	N/A
N/A	Mechanical, electrical and plumbing (MEP)
N/A	Sustainability
N/A	Real Estate development
N/A	Coding
N/A	Contracting Services
N/A	Project Coordination

Architects in Brazil tend to work predominantly with architectural design and construction, despite the profession not being reduced to such (POR CONSELHO DE ARQUITETURA E URBANISMO DO BRASIL, 2019). This characteristic of the profession is reflected upon the interns' scope of actuation within FECFAU-UNICAMP, in which most act in architectural and construction projects, followed by interior design and design activities (Fig. 7). Thus, the branch of the DCN's Nucleus of Professional Knowledge of Architectural Design was the segment with the uttermost adherences amongst interns and the local AEC industry.

Landscape architecture does not figure as one of the main activities of architects and urban designers in Brazil (POR CONSELHO DE ARQUITETURA E URBANISMO DO BRASIL, 2019), despite recent efforts for an independent professional union separated from architects and urban designers per se (*CAU/BR reitera posição contrária à regulamentação da profissão de paisagista | CAU/GO*, [s.d.]). This is due to the fact it is an area that demands extensive interdisciplinary knowledge related to botany, biology, agriculture, amongst others, which could render a rather different path of continuous specialization for architects and urban planners seeking autonomy along this path. However, there was observed a small, yet persistent, adherence with DCN's segment of landscape architecture amongst interns and the Campinas' job market.

Although there are adherences between Urban Design and Urban Planning with the DCN's Nucleus of Professional Knowledge, there were not significant interns engaged within

these areas. These facts demonstrate that, despite being urgent in terms of national and regional development, such areas are not a priority for the regional AEC industry.

Some DCN's nuclei like 'Theory and History of Architecture, of Urbanism, and of Landscape Architecture', 'Construction Technology', 'Structural Systems', and 'Topography', even though explicitly mentioned in the DCN, did not have expressive numbers of interns in the period of study. In Brazil, even though such competencies of a rather technical fashion are usually handed to a civil engineer, they can also be performed by architects and urban designers. In fact, it is important to note that in Brazil, architects and urban designers are allowed to design and calculate structural systems, as well provide services related to topography (LEI N° 12.378, DE 31 DE DEZEMBRO DE 2010, [s.d.]), despite arguably not being profoundly trained in these technical realms during their undergraduate course. Even though 'Theory and History of Architecture, of Urbanism, and of Landscape Architecture' is an exclusive attribution for architects in Brazil, not being allowed to be performed by analogous professions such as civil engineers and interior designers, it has been explored only in an academic fashion, regionally speaking. Furthermore, these appointments reflect the manner in which the regional industry, in which there is no demand for such realms of the Architecture and Urban Design profession.

Even though in a little quantity, there have been some accounts of interns engaging in the fields of Mechanical, Electrical and Plumbing (MEP), Sustainability, Real State development, Coding, Contracting, Services, and Project Coordination. Such fields are not accounted for in the DCN's Nucleus of Professional Knowledge, demonstrating that the industry is in constant evolution and that new areas of actuation might arise upon the absorption of new skill sets by architects and urban designers. This could foment constant feedback for the updating of the DCNs up to the industry's necessities.

After such analysis, it is important to reflect upon the fact that the DCN' Nucleus of Professional Knowledge partially reflects the local AEC industry demands, needing and fomenting its continuous updating upon its ever accelerating production problems. Thus, one of the main contributions of this paper is the presentation of the panorama of architectural internships in FECFAU-UNICAMP versus the local industry, in a manner as to understand the local industry's necessities and foster future DCN's improvements, as well as eventual course curricular adjustments.

It is hoped that these writings transcend the statistical nature of a simple panorama and seek to assist the course of Architectural Internship in UNICAMP's FECFAU to a more industry-based criteria instead of a bureaucratic documentation and verification instrument. It is worth noting that these writings can assist local course designers to verify align educational and professional requirements, in more than a simplistic market assessment fashion, but as a social and infra-structure wise, in a national-developmental platform.

Every research has limitations, and the pandemics has certainly taken its toll in this particular study for it fostered a certain distancing between students and their internship opportunities. Thus, the web-based forms were adjusted based on feedback from the

actual interns and their reports, seeking to adjust the discipline to the industry's aspirations.

When it comes to future research, it is possible to continue to accompany the statistical data of architectural internships at UNICAMP's FECFAU during the next two-year cycle in order to note patterns in our student's professional insertion. Furthermore, this type of study shall allow the continuous improvement of our teaching experiences and undergraduate curriculum with a focus on the professional development of our students.

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