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CERTIFICATION OF WELL-BEING IN ACADEMIC SPACES

CERTIFICAÇÃO DO BEM-ESTAR EM ESPAÇOS ACADÊMICOS

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Abstract
Buildings exert a direct influence on the behavior and health of their occupants. Tools such as environmental certifications allow for the evaluation and measurement of this impact, ena-bling adjustments and improvements in the user experience. A well-designed and executed building, with a focus on environmental quality and integrated with policies that promote well-being, can enhance user performance and satisfac-tion. This study evaluated an educational build-ing through the application of the WELL Environmental Certification, which focuses on hu-man well-being. The objective was to qualify users' experiences through an analysis of architecture, biophilic elements, and neuroarchitecture. To this end, six indices of the WELL Certification were assessed: air, lighting, thermal comfort, materials, mind, and community—all related to the responsibilities of architects and institutional managers. At the conclusion of the study, a critical diagnosis of the certification indices will be presented, based on user surveys and the referenced bibliography, aiming to contribute to the improvement of well-being in educational environments.

Keywords: Built Environment. Well-Being. Biophilia. WELL Certification. Education.

Resumo
As edificações exercem influência direta sobre o comportamento e a saúde de seus ocupantes. Ferramentas como certificações ambientais permitem avaliar e mensurar esse impacto, possibilitando ajustes e melhorias na experiência dos usuários. Um edifício bem planejado e executado com foco na qualidade ambiental, integrando políticas que promovem o bem-estar, podem potencializar o desempenho e a satisfação dos usuários. Este trabalho ava- liou uma edificação educacional por meio da aplicação da Certificação Ambiental WELL, que tem como foco o bem-estar das pessoas. Buscou-se qualificar a experiência dos usuá- rios por meio de uma análise da arquitetura, dos elementos biofílicos e da neuroarquitetu- ra. Para isso, foram avaliados seis índices da Certificação WELL: ar, iluminação, conforto térmico, materiais, mente e comunidade, to- dos relacionados às competências do arquiteto e do gestor institucional. Ao final do estudo, será apresentado um diagnóstico crítico dos índices ligados à certificação, com base na pesquisa realizada com os usuários e na bi- bliografia utilizada, visando contribuir para a melhoria do bem-estar nos ambientes educacionais.

Palavras-chave: *Ambiente Construído. Bem--estar; Biofilia. Certificação WELL. Educação.*

1 INTRODUCTION

People spend an average of 90% of their time within built environments, making the need to design spaces that are both welcoming and health-promoting increasingly evident. Following the COVID-19 pandemic, which contributed to a rise in cases of anxiety and depression, discussions on the importance of support- ive environments have become more frequent, particularly given the prolonged periods of home confinement required by social isolation. The pandemic triggered a 25% increase in the global prevalence of anxiety and depression, with young people among the most affected, making the study of academic environments particularly relevant, as this is where they spend much of their lives.

With depression being the leading cause of disability worldwide, built environments can play a direct role in its onset. The architecture of educational envi- ronments is particularly noteworthy, as this is where most of the world's popula- tion spends much of their time during the first decades of life, while also housing a significant portion of the processes through which knowledge is developed at both the individual and societal levels.

University students typically spend an average of 5 to 8 hours per day in learning and work environments, engaged in extensive tasks which demand at- tention, focus, and, at times, creativity. Accordingly, the environment influences students' emotional stress, happiness, stimuli, cognitive function, social support, and sense of belonging.

How each educational space is designed, executed, and maintained has a direct impact on the learning process. When planning educational environments, architectural elements can be integrated to foster a positive impact on students. The primary factors and elements that influence learning include access to nature, lighting, ergonomics, acoustic barriers, ventilation, environments equipped with electrical outlets, and adaptable spaces designed for multiple uses.

Technological, scientific, and social advances have led to the emergence of new pedagogies and methodologies in educational systems, which in turn are re- flected in the architectural design of classrooms. In this regard, assessing how buildings influence academic life becomes relevant, considering performance in- dicators, environmental certifications, and post-occupancy studies.

A wide range of tools have been developed to evaluate and certify buildings, addressing various aspects such as energy efficiency, environmental performance, and sustainability. Among these factors, particular attention is given to those aimed at improving users' quality of life, with a focus on both physical well-be- ing and mental health within built environments. In this context, environmental psychology plays a significant role in examining how spatial characteristics can influence emotions, behaviors, and perceptions, eliciting different sensations in individuals and directly shaping their experience and relationship with the environment.

Well-being in built environments is closely tied to the users' sense of iden- tification with the space. Neuroscience applied to architecture, known as *neuro- architecture*, integrates advances in neuroscience and neuroimaging techniques to investigate the relationship between built environments and the individuals who interact with it. Among the strategies that use the principles of neuroarchitecture is the concept of biophilia, which refers to the human need for connection with nature in order to promote well-being.

Given that people spend most of their lives in built environments, much of which occurs in academic settings, there is a clear need to design educational spaces that support health and, consequently, foster the intellectual capacity of their users. Post-occupancy evaluation (POE) assesses the performance of envi- ronments in use, and evidence-based *design* also draws upon POE findings, there- by aligning project development more closely with environmental psychology and emphasizing the person–environment relationship. POEs should prioritize users' health, safety, and satisfaction.

Technologies applied to a more sustainable construction contribute signif- icant benefits to users' health by prioritizing factors such as air quality, natural light, and thermal comfort. The WELL Certification, which offers an approach directed toward promoting well-being in built environments, proved appropriate as a framework for conducting a post-occupancy evaluation to assess the comfort of users of the higher education institutional building investigated in this study.

The results of the study, through the application of WELL Certification, led to the analysis of barriers and opportunities for achieving human well-being, con- tributing to managers, designers, and users of the institution with regard to the criteria applied and evaluated, as well as to the expansion of knowledge.

2 THEORETICAL FRAMEWORK

According to Hommerding (2019), the well-being of occupants in built en- vironments is closely linked to how space is perceived, as this perception signifi- cantly influences human behavior. Professionals directly involved in shaping built environments play a key role in creating spaces that, in addition to meeting basic functions, also promote physical, psychological, and social comfort.

The concept of well-being gained broader recognition at the 2014 World Economic Forum, which included monks who led meditation practices and lectures emphasizing the theme of "Happiness", thereby indicating a paradigm shift in relating the topic to economics. The development of new technologies and methodologies for evaluating and analyzing factors related to happiness and well-being has resulted in the growing integration of the subject into work, study, domestic life, and even human physiological contexts. This phenomenon broad- ened the well-being agenda, reaching an audience beyond the participants of the World Economic Forum, and leading to the flourishing of a niche market, and gradually attracting those focused on its thriving (Pereira, 2024).

In 1946, the World Health Organization (WHO) defined health as a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity. According to Gomes (2024), well-being is a contemporary and highly relevant topic, and has been increasingly investigated to understand how this variable affects daily life on the emotional, social, and psychological lev- els.

Well-being can be understood as the combination of two dimensions, the affective and the cognitive. The affective dimension relates to satisfaction and emotions, while the cognitive dimension concerns personal and professional ful- fillment. Well-being in the environment is associated with processes which foster positive sensations among individuals within organizations. Their perception of the space is influenced by sensory and emotional factors, enabling information retention and creativity levels ranging from 50% to 70% in multisensory envi- ronments. In built environments, architectural elements can stimulate the brain, eliciting emotions and feelings that, in turn, shape human behavior (Hommerd- ing, 2019).

Neuroscience is the field that studies the central nervous system, its struc- tures, functions, molecular mechanisms, and the processes underlying its opera- tion (Paiva *et al*., 2021). Neuronal activity within the structures of the nervous system, triggered and regulated by lived experiences, is the element that enables learning. From a neurological perspective, this learning fosters the development of mental functions such as attention, emotion, motivation, memory, language, and logical-mathematical reasoning (Amaral; Guerra, 2022)

Pedagogical, didactic, and physical strategies employed in teaching and learning provide stimuli that enhance the development of mental functions. Such stimuli promote the reorganization of the nervous system, enabling the acquisi- tion of new knowledge, skills, and attitudes. Social interactions and the physi- cal environment generate neural stimuli that facilitate learning (Amaral; Guerra, 2022).

According to recent studies, the educational system must foster skills such as focus, self-control, critical thinking, creativity, and healthy social interaction, while it is also important that students themselves be aware of the elements that may best support their learning (Pedro, 2017).

It is recognized that each individual receives and interprets environmental stimuli in a unique way. Investing in visual, tactile, auditory, and olfactory stimuli can be crucial when designing environments. Architecture, therefore, can stim- ulate individuals with multisensory environments that engage visual, olfactory, auditory, emotional, and tactile memories (Santos, 2023).

According to Paiva *et al*. (2021), it is possible to encourage people through their environments, as architecture functions as an extension of the human being and should be conceived as a multisensory space. Architecture proposes an expe- rience of the world capable of enhancing the user’s sense of reality and personal identity. Architecture’s core mental task is both to accommodate and integrate.

2.1 Neuroarchitecture

Neuroarchitecture is an interdisciplinary field connecting the knowledge from neuroscience and neuroimaging techniques to the study of built environ- ments and the people who use them (Gonçalves; Paiva, 2018). Neurochitecture studies the impact that the physical environment has on the brain. Such impact is understood as an unconscious transformation that triggers behavioral change within the individual (Paiva *et al*., 2021).

Neuroarchitecture assesses the relationship between the brain and the inhab- ited environments, with the goal of creating spaces capable of promoting benefi- cial effects on the mind. The perception of space unconsciously shapes emotions and behaviors, varying according to past memories and experiences. The brain is continuously activated in response to that which is observed and experienced, associating memories with specific places (Santos, 2023).

Several spatial and environmental factors influence the human brain and affect an individual's behavior and well-being. One of these factors is lighting. According to Mendes (2023), human growth and development depend on the exposure to and reliance on daylight. Day-night cycles are associated with the production of hormones such as serotonin during the day and melatonin at night. The circadian cycle represents the body's adaptation to perceiving day and night, and plays a key role in regulating sleep time, appetite, body temperature, hormone levels, alertness, blood pressure, and metabolism.

Mendes (2023) also advocates that daylight is regarded as the ideal light source for synchronizing the circadian cycle in human beings. When people spend most of their time indoors, under artificial lighting that does not match daylight in quantity, spectrum, or distribution, the differentiation between day and night is impaired, compromising health and well-being. According to Santos (2023), exposure to natural light can reduce the risk of depression, help regulate the circa- dian rhythm, and improve both sleep quality and its integration with the body's biological systems.

Elements such as lighting, ventilation, temperature, colors, textures, and spa- tial organization affect the way environments are experienced. When these factors are well calibrated, users feel more comfortable, productive, and satisfied, leading to a more positive spatial experience (Paiva *et al*., 2021).

2.2 WELL Certification

Selected as the framework for this study, the WELL Certification originated in the United States and is administered by the International WELL Building Institute (2024a). It is designed to address the need for a human-centered quality system, focusing on health and well-being, with an emphasis on creating healthy and comfortable indoor environments (Mendes, 2023).

According to Mendes (2023), the focus on well-being is justified by the fact that the WELL Certification includes a broader range of specific health-related credit requirements for occupants compared with certifiers that primarily con- sider the scope of sustainable design. In addition to prioritizing well-being and health, it serves as a tool to increase the productivity of those who use the building (Mendes, 2023).

The certification is an evidence-based system for measuring, certifying, and monitoring the performance of building features that affect health and well-being. As noted by Mendes (2023), it differs from other certifications primarily through the involvement of users in the certification process, which promotes awareness of the required criteria and fosters occupant understanding of the concept of well-being and its impact on health, which is strongly emphasized throughout the WELL standard.

According to Pereira (2024), the WELL Certification established a new benchmark for promoting health in built environments through the creation and validation of specific criteria focused on well-being. The WELL Building Standard methodology is both evidence- and performance-based.

The first version of the WELL Certification encompassed seven categories: Air; Water; Nourishment; Light; Movement; Comfort; and Mind. In 2018, how- ever, its second version expanded the framework to ten categories, with the in- clusion of Sound, Materials, and Community. The certification also includes an Innovation category, which allows projects to earn extra points (IWBI, 2020).

The WELL Certification can be awarded at Bronze (up to 40 points), *Silver* (41–50 points), *Gold* (51–60 points), or *Platinum* (80 points or more) levels. Each level also requires a minimum score per concept, being: one point for *Silver*, two for *Gold*, and three for *Platinum*. Projects may also earn up to 10 additional points under the Innovation concept.

Figure 1.

WELL Certification.

Source: Adapted from the International WELL Building Institute (2024b).

The performance requirements established by the WELL Certification are organized into ten categories, covering 102 features of the project, divided into Preconditions and Optimizations, each further broken down into parts to be met through design, measurements, or protocols (reports, letters, documentation). In the case of new buildings, all prerequisites must be met, and certification is deter- mined by the score obtained through additional items (Mendes, 2023).

Based on the analysis of environmental certifications, the WELL Certifica- tion was selected for application and investigation in this study, in a higher educa- tion building. This choice was grounded in the fact that WELL is the certification system with the highest number of features directly related to well-being in built environments.

For the purposes of this study, the WELL Certification categories considered to fall within the responsibilities of the architect/administrator and relevant to this research are: Air (maximum of 3 points), Light (maximum of 18 points), Movement (maximum of 17 points), Thermal Comfort (maximum of 6 points), Mind (maximum of 19 points), and Community (maximum of 4 points), which will be presented in greater detail in the Methodology section. Indicators within the Materials category would also be relevant to the architect's responsibilities in design and specification. However, since the building under study is already constructed, this category cannot be verified or modified in the present work and, therefore, will not be analyzed.

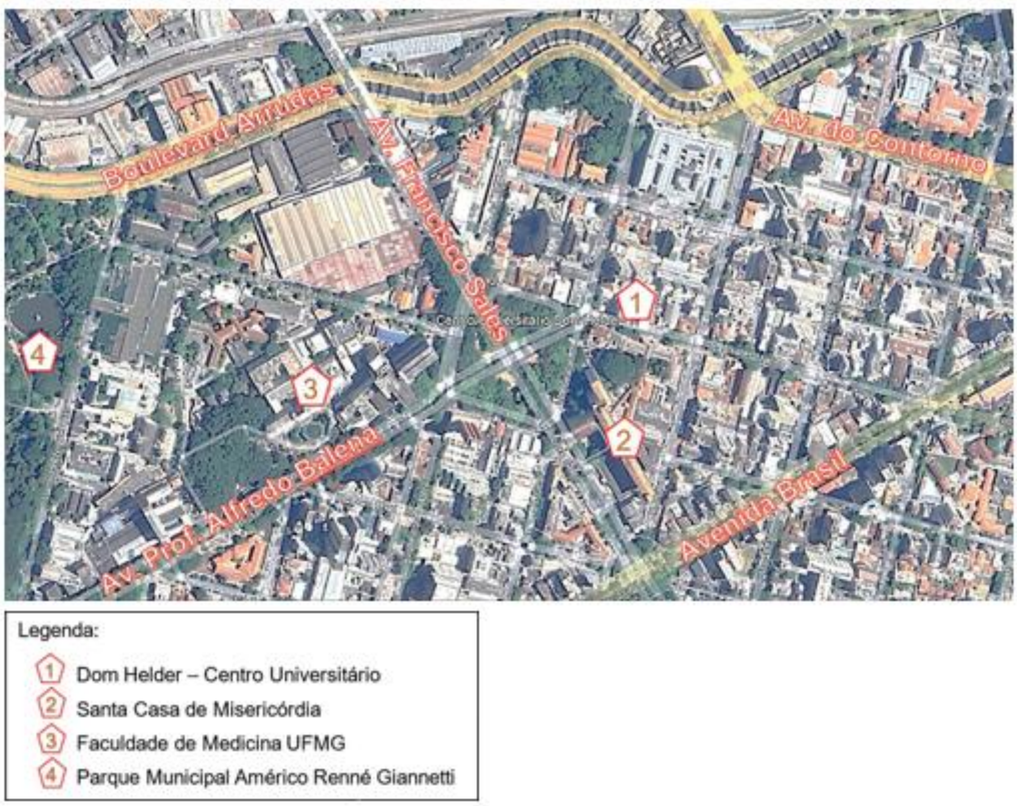
3 METHODOLOGY

This study adopted a qualitative and exploratory approach, based on the evaluation of the WELL Certification in an existing academic building. The main objective was to examine how elements of built environments contribute to user well-being, drawing on the WELL Certification indicators most relevant to the roles of the architect and the manager.

The research took place at Centro Universitário Dom Helder in Belo Hori- zonte, selected for already integrating design elements consistent with well-being strategies. The site was also chosen due to the feasibility of access and the impor- tance of investigating academic spaces in relation to the environmental quality of their built environments.

Figure 2.

Location — Centro Universitário Dom Helder Câmara.



Source: prepared by the authors.

The research design comprised three stages aimed at generating results, along with a final stage focused on analyzing those results, as detailed below:

1. Survey of the architectural project and identification of elements/attributes re- lated to user well-being within the building, based on WELL Certification and the responsibilities of the architect/manager.

- Sorting of the WELL Certification items corresponding to the architect/ manager's responsibilities.
- Classification and scoring of the building according to said items.

2. Study and application of findings through technical analyses.

- Analysis and verification of the selected WELL Certification concepts.
- Circadian lighting analysis.

4 METHODOLOGY

Initially, the WELL Certification applicable items attributable to the archi- tect or administrative manager were mapped. This step carefully filtered the eval- uation guidelines for an existing building. The selected items were then organized into effort levels (low, medium, and high) and assessed for their scoring potential. Next, a survey of the spaces selected for analysis was conducted: the Model

Lab (first floor), the *Innovation Lab* (second floor), and the teachers' lounge (third floor). In addition to these, the *hall* and internal vertical circulation (ground floor) were also surveyed, as the WELL Certification includes them in its scoring system. The spaces were modeled in 3D using *Rhinoceros software*, with natural light sim- ulations carried out through the *ClimateStudio plugin* to evaluate solar incidence, natural lighting performance, and effects on the users' circadian rhythms. This stage was guided by the criteria established in version 2 of the WELL Certifica- tion, aligned with standards such as EN 17037 and IWBI guidelines.

Finally, a technical visit was conducted to collect photographic data and survey actual conditions of use and furnishings, in order to verify ergonomics, accessibility, artificial lighting, ventilation, thermal control, and existing biophilic elements. All the documentation generated supported the application stage of the certification indicators.

4.1 Indicators

The indicators selected for evaluating the project under the WELL Certifi- cation were Air; Light; Movement; Thermal Comfort; Mind; and Community.

They were selected for either being part of the architectural project's scope or directly related to administrative decisions made by the building's managers.

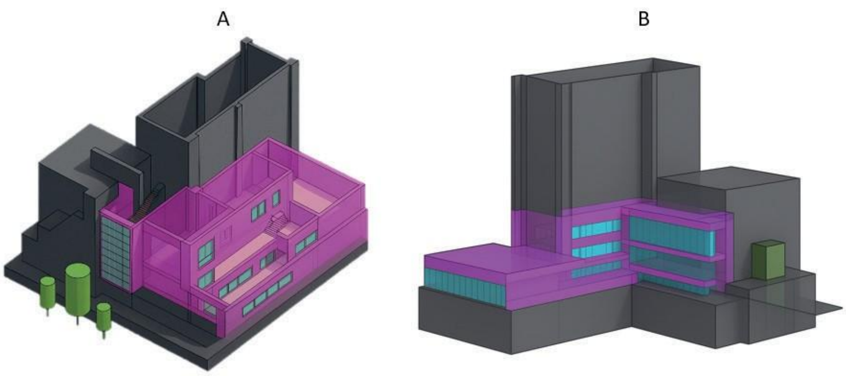
5 RESULTS AND DISCUSSION

According to the survey, the WELL Certification elements that promote user well-being at Centro Universitário Dom Helder were identified and evaluated. The results are presented below, organized according to the main indicators ana- lyzed: Air, Light, Movement, Thermal Comfort, Mind, Community, and Inno- vation.

Figure 3 shows external views of the building's volumetry, highlighting the floors selected for analysis. Openings that allow the entry of natural light can be observed, along with active facades (operable windows).

Figure 3.

Volumetry of the building studied – (A) and (B) views.



Source: prepared by the authors.

Figure 3 presents an interior view of the Model Laboratory (first floor), the *Innovation Lab* (second floor), and the teachers' lounge (third floor). Natural light is provided through window frames and skylights, complemented by artificial lighting, ergonomic furniture, and spatial organization that facilitate movement, along with biophilic elements that foster creativity and focus.

On the second floor, the *Innovation Lab*—located in the annex—features ergonomic and functional furniture, window frames, and a skylight ceiling that provide natural light, biophilic elements, and high-quality artificial lighting.

Figure 4.

First, second, and third floors, respectively.

Source: photo by the authors.

The teachers' lounge also features ergonomic and functional furniture, glazed facades, and a skylight ceiling, which provide natural light, biophilic elements, and high-quality artificial lighting.

Figure 5 presents a view of the Arena—a large, dynamic environment de- signed for interactive activities, lectures, and collaborative learning—as well as an image of the Immersive Space, a technological setting with sensory and visual stimuli that allows students to decompress. In both spaces, adaptive design fea- tures and restorative capacity were emphasized.

Figure 5.

Arena, ball pit, and game room.

Source: photo by the authors.

Figure 6 presents the *parklet*, an outdoor space designed with biophilic el- ements, benches, and vegetation, providing an area for relaxation and social in- teraction. This accessible space is integrated into the academic environment and functions as an urban square, promoting direct access to nature and contributing to well-being and mental health.

Figure 6.

Parklet.

Source: photo by the authors.

The six items related to the architect/manager, surveyed in the building, were documented, evaluated, and scored according to specific WELL Certification cri- teria.

1. Air: scored based on no-smoking signage, active facades, and mechanical cool- ing with user control.

2. Light: scored based on openings that provide natural light, the quality of arti- ficial lighting, and the ability to control artificial lighting.

3. Movement: scored based on:

a) Furniture ergonomics (height adjustments, casters, etc.).

b) Directional signage and access quality; accessibility; sidewalk quality; bicycle lanes and bicycle parking; pedestrian-friendly façades; canopies; and biophilic design elements.

c) Easy access to public transportation.

4. Thermal Comfort: scored based on active facades (operable windows), me- chanical ventilation, air conditioning with accessible temperature control, and external

pedestrian pathways shaded by canopies and/or trees.

5. Mind: scored based on:

a) Promoting access to nature, biophilic materials, calming colors, music, and water sounds.

b) Restorative spaces (game room, ball pit, and Arena) with controlled lighting, temperature, acoustics, and active furniture.

c) Personalized Service Center (Núcleo de Atendimento Personalizado, NEP), of- fering individual and group psychological counseling for teachers and students.

d) Access to outdoor nature through wide, tree-lined sidewalks and the *parklet*.

6. Community: scored highly due to accessibility and universal design across all institutional spaces.

5.1 Indicator analysis

Table 1.

Summary table of scores obtained under the WELL Certification

#	Category	Analyzed items	Obtained score	Maximum score
1	Air	Smoking ban, mechanical ventilation control, and active facades	3	3
2	Light	Openings for natural light, artificial lighting quality, and lighting control	8	17
3	Movement	Furniture ergonomics, accessibility, bicycle lanes, bicycle parking, and biophilic elements	7	17
4	Thermal Comfort	Active facades (operable windows), mechanical thermal control, and external shading along pedestrian pathways	6	6
5	Mind	Access to nature, biophilic materials, calming colors, therapeutic sounds, and restorative spaces	7	19
6	Community	Universal accessibility in all institutional spaces	4	4

Source: prepared by the authors.

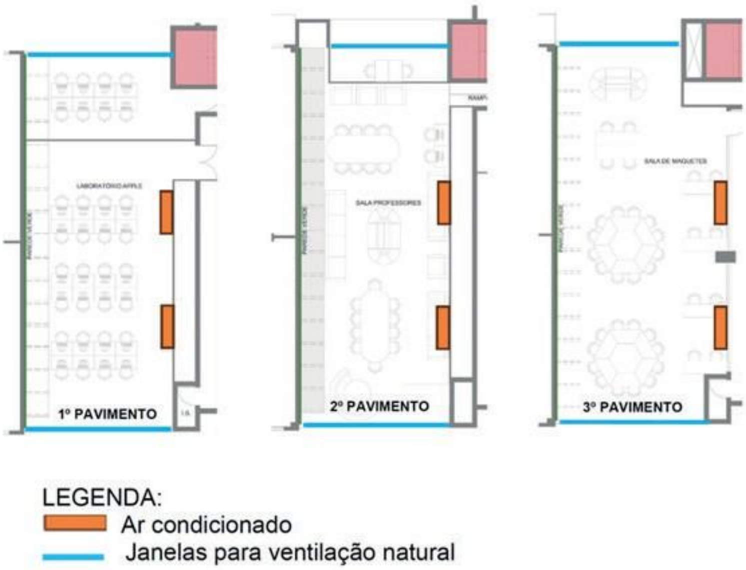
5.1.1 Air

Evaluated criteria: no-smoking signage; mechanical ventilation and its con- trol; active facades (operable windows).

The building partially meets the criteria, as it provides adequate no-smoking signage and cooling systems that allow for partial user control. However, it is important to note the potential for investment in continuous air quality monitor- ing technologies, as well as improvements to natural ventilation in critical areas through new window frames or operable mechanisms.

Figure 7.

Plans with legend indicating ventilation[1].



Source: prepared by the authors.

5.1.2 Light

Evaluated criteria: natural light access; quality and control of artificial light- ing; circadian lighting analysis.

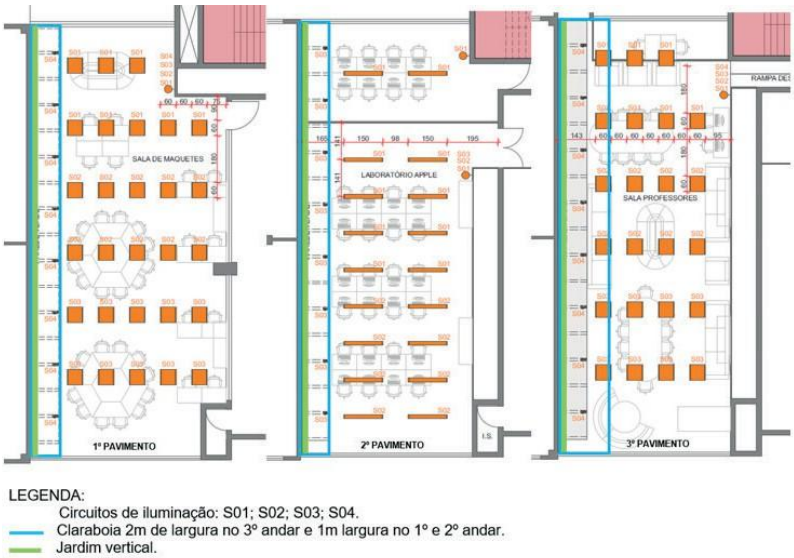
The building provides adequate natural light openings in the main areas an- alyzed (Computational Design Lab, Model Lab, Multipurpose Space, Immersive Space), ensuring satisfactory performance. As an improvement, dynamic light- ing with adjustable intensity

[1] Apple lab; 1st floor; Teacher's lounge; 2nd floor; Model room; 3rd floor; Key; Air conditioning; Windows for natural ventilation.

and spectrum, synchronized with users' circadian rhythms, could be implemented.

Figure 8[2].

Plans with legend indicating lighting



Source: prepared by the authors.

5.1.3 Movement

Evaluated criteria: furniture ergonomics; active furniture; universal accessi- bility; quality of sidewalks and bicycle paths; biophilic spaces.

The ergonomics of active furniture (with casters) were met, as was conve- nient access to outdoor spaces such as bicycle lanes and sidewalks. Directional signage is effective, clearly guiding visitors to designated areas.

[2] Model room; 1st floor; Apple Lab; 2nd floor; Teacher's lounge; 3rd floor; key; lighting circuit; 2m wide skylight on 3rd floor and 1m wide skylight on 1st and 2nd floor; vertical garden

Figure 9[3].

Plans for the entrance hall.

Source: prepared by the authors.

5.1.4 Thermal control

Evaluated criteria: possibility of temperature control in indoor environ- ments; mechanical and natural ventilation.

The building features adequate thermal control systems, with mechanical ventilation and active facades.

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[3] Key LED panel exhibiting events and expositions; piano for musical events; auditorium; photograph- ic exhibitions; immersive space exhibiting timelines and awards; window façade; empty; auditorium; stage; access hall to the auditorium; room; ramp down; reception; lobby; sidewalk; vehicles access; pedestrian access.

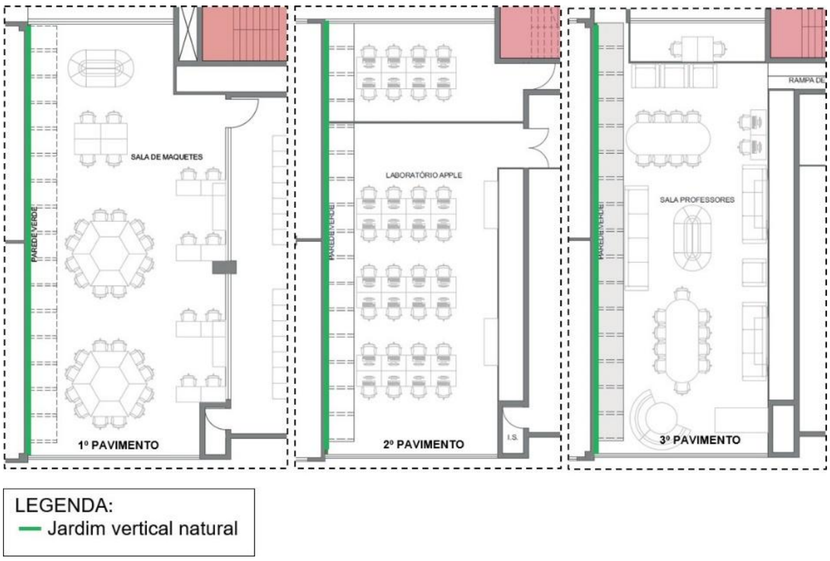
5.1.5 Mind

Evaluated criteria: biophilic elements; restorative spaces; calming colors; therapeutic sounds.

The institution features areas with biophilic elements, such as the vertical garden in the teachers' lounge, the Computational Drawing Room, and the Mod- el Room; active and permeable facades and skylights in all three spaces; restorative areas (game rooms and the Immersive Space); and the *parklet* at the institution's entrance. Such environments foster a positive experience for mental well-being and could be replicated and expanded throughout the institution's building as a potential improvement.

Figure 10[4].

Plans of the analyzed environments with legend indicating the vertical garden.



Source: prepared by the authors.

[4] Model room; 1st floor; apple lab; 2nd floor; teacher's lounge; 3rd floor; key; vertical natural garden.

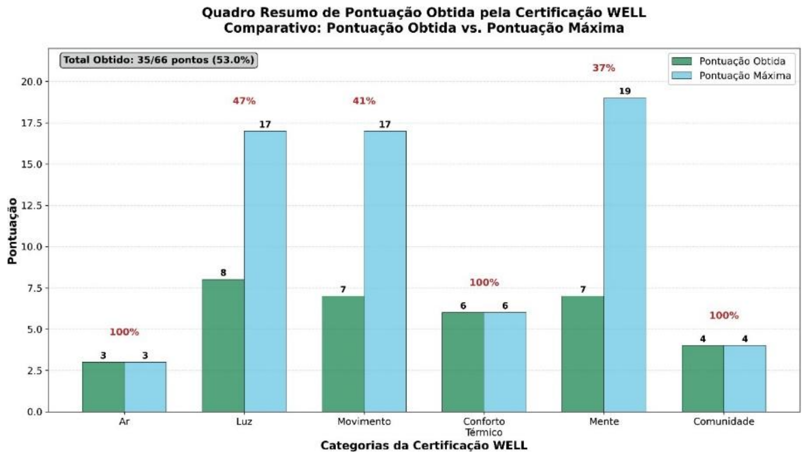
5.1.6 Community

Evaluated criteria: universal accessibility; inclusion of accessible spaces. The building meets the criteria for universal accessibility across all institutional spac- es; however, additional educational and cultural programs could be developed to strengthen users' sense of commu

Graph 1 presents a synthesis of the analyzed items, clearly showing that the observations can support the building in reaching higher levels of WELL Certifi- cation, consolidating it as a model of well-being in academic settings.

Graph 1[5].

Score obtained under WELL Certification. Comparison: actual score vs. maximum score.



Source: prepared by the authors.

Some environments present the potential to enhance user well-being through the implementation of strategies aligned with the concepts of WELL Certifica- tion. Light and Mind categories stood out due to the incorporation of natural lighting (L01 – Natural Light Simulation) and biophilic elements (M02 – Nature and Location), including restorative spaces (M07 – Provide Restorative Space) that promote connection with nature. The Thermal Comfort category achieved the maximum score (6/6 points) through hybrid climate-control systems and operable windows (T08 – Enhanced Operable Windows), while the Air catego- ry reached 100% performance through smoke-free environments and adequate ventilation. The results show that the building obtained 35 of the 66 possible

[5] Total score; 35/66 points; actual score; maximum score; score; air; light; movement; thermal comfort; mind; community; WELL certification categories

points (53%) in the six categories evaluated, featuring satisfactory performance, particularly in the categories Air, Thermal Comfort, and Community, all of which achieved maximum scores. However, Light (47%), Movement (41%), and Mind (37%) categories could be improved, as the analysis could be expanded to include the four WELL concepts not evaluated—Water, Nourishment, Sound, and Mate- rials—with the aim of achieving a more comprehensive certification and creating an environment that further promotes health and well-being.

6 CONCLUSION

This study presented an in-depth analysis of the academic building at Centro Universitário Dom Helder from the perspective of the WELL Certification, re- vealing a satisfactory performance of 35 out of 66 possible points (53%) across the six categories evaluated. The results show that the institution achieved excellence in three key categories—Air, Thermal Comfort, and Community—all with 100% performance, demonstrating the success of design strategies focused on environ- mental quality and user well-being.

The integrated analysis of WELL technical criteria and user perceptions, col- lected through a questionnaire administered to 77 participants, confirmed the effectiveness of the architectural interventions implemented. Among the catego- ries, Mind stood out as the most valued by occupants, empirically reinforcing the importance of biophilia and restorative design in educational environments. The finding validates the theories of neuroarchitecture applied to education and demonstrates that connection with natural elements directly impacts users' psy- chological well-being.

Although underperforming, the Light (47%), Movement (41%), and Mind (37%) categories present concrete opportunities for improvement that could sig- nificantly raise the overall certification score. Suggested improvements include the implementation of more advanced circadian lighting systems, greater spatial flexibility, and the expansion of biophilic elements in the environments.

The main scientific contributions of this study are, first, that it empirically demonstrates the positive correlation between WELL Certification principles and user satisfaction in Brazilian academic environments, and second, that it provides quantitative evidence to support future research in the field. Second, the methodology developed, which integrates technical analysis and subjective perception, establishes a replicable protocol for evaluating existing educational buildings. Finally, the results provide practical guidelines for managers and architects seeking to implement well-being strategies in educational institutions.

The research lists Centro Universitário Dom Helder as a pioneer in the sys- tematic application of the WELL Certification within the Brazilian educational context, demonstrating that it is possible to combine academic excellence with environments that promote health and well-being. The findings reinforce that investments in neuroarchitecture and biophilic design are not merely trends but essential requirements for creating educational spaces that enhance learning, cre- ativity, and the holistic development of their users.

Ultimately, this work contributes to the advancement of knowledge at the intersection of architecture, neuroscience, and education, offering both theoreti- cal and practical insights for transforming academic environments into catalysts of well-being and educational excellence.

REFERENCES

ABOUT BREEAM. *BREEAM Certification*, 2024. Available from: https://breeam.com/about/. Access on: Nov 28, 2024.

AMARAL, A L. N.; GUERRA, L. B. *Neurociência e educação:* olhando para o futuro da aprendiza- gem. Brasília, DF: Serviço Social da Indústria, 2022.

ASSOCIAÇÃO BRASILEIRA DE NORMAS TÉCNICAS. *ABNT NBR 15.215:* Iluminação nat-

ural, Parte 4: Verificação experimental das condições de iluminação natural interna. 2. ed. Rio de Janeiro: ABNT, 2023.

CLEMENT, J., MILES, M. *Screen schooled:* two veteran teachers expose howtechnology over use is making our kids dumber. Melbourne: Black Ink, 2017.

FALAVIGNA, R. F.; BAVARESCO, A. M. A psicologia do espaço construído. *Anuário Pesquisa e Extensão Unoesc São Miguel do Oeste*, [*S. l.*], v. 3, e19643, 2018. Available from: https://periodicos. unoesc.edu.br/apeusmo/article/view/19643. Access on: Dec. 20, 2024.

FUNDAÇÃO CARLOS ALBERTO VANZOLINI. AQUA-HQE™. *Vanzolini.org*, 2024. Available from: https://vanzolini.org.br/organizacoes/certificacoes/aqua-hqe/. Access on: Nov. 28, 2024.

GLOBAL MIND PROJECT. *The Mental State of the World in 2023:* a perspective on internet-en- abled populations. [*S. l.*]: Global Mind Project, 2024. Available from: https://mentalstateoftheworld. report/2023_read/. Access on: Dec. 19, 2024.

GOMES, T. B. *Satisfação profissional e bem-estar no trabalho:* análise e impacto no desempenho em contexto laboral. Dissertação (Mestrado em Gestão de Negócios) – Escola de Economia e Gestão, Universidade do Minho, Braga, 2024.

GONÇALVES, R; PAIVA, A. *Triuno:* neurobusiness e qualidade de vida. 3. ed. Joinville: Clube de Autores, 2018.

HOMMERDING, M. *Análise do impacto de novas estratégias de projeto no bem-estar dos usuários em uma edificação corporativa:* o caso da certificação WELL e da neurociência aplicada à arquitetura. Artigo (Pós-Graduação em Construção Civil: Gestão, Tecnologia e Sustentabilidade) – Universidade do Vale dos Sinos, Porto Alegre, 2019. Available from: https://repositorio.jesuita.org.br/bitstream/handle/UNISINOS/8733/Mariana%20Hommerding_.pdf?sequence=1&isAllowed=y. Access on: Sept. 1, 2025.

INTERNATIONAL WELL BUILDING INSTITUTE. *WELL Certified*. 2024a. Available from: https://www.wellcertified.com/. Access on: Nov. 4, 2024.

INTERNATIONAL WELL BUILDING INSTITUTE. WELL Versão 2, Q3-Q4-2024. *Well Certi-*

fication, 2024b. Available from: https://v2.wellcertified.com/en/wellv2/overview. Access on: Nov. 28, 2024.

INTERNATIONAL WELL BUILDING INSTITUTE. Apendice. *Well Certification*, 2024c. Avail- able from: https://v2.wellcertified.com/en/wellv2/appendix/t1. Access on: Nov. 28, 2024.

LACERDA, C. S. *Indicadores de conforto, saúde e bem-estar em avaliação pós-ocupação:* estudo de caso de edifício comercial certificado LEED em Belo Horizonte. Tese (Doutorado no Programa de

Pós-Graduação em Ambiente Construído e Patrimônio Sustentável) – Escola de Arquitetura, Univer- sidade Federal de Minas Gerais, Belo Horizonte, 2021. Available from: https://sites.arq.ufmg.br/pos/ ambienteconstruido/wpcontent/uploads/2021/07/Tese-Doutorado-Cristiane-Silveira-de-Lacerda. pdf. Access on: Sept. 1, 2025.

MENDES, L. C. F. *Fatores humanos na arquitetura para a saúde:* indicadores e percepções. Disser- tação (Mestrado no Programa de Pós-Graduação em Ambiente Construído e Patrimônio Sustentável) – Escola de Arquitetura, Universidade Federal de Minas Gerais, Belo Horizonte, 2023. Available from: https://repositorio.ufmg.br/handle/1843/53622. Access on: Sept. 1, 2025.

MINISTÉRIO DA SAÚDE. 05/8 ␦ Dia Nacional da Saúde. *Biblioteca Virtual em Saúde*, [1970?]. Available from: https://bvsms.saude.gov.br/05-8-dia-nacional-da-saude/. Access on: Dec. 13, 2024.

ONO, R. *et al. Avaliação pós-ocupação na arquitetura, no urbanismo e no design:* da teoria à prática. São Paulo: Oficina de Textos, 2018.

PAIVA, M. M. *et al. Neuroarquitetura:* a neurociência no ambiente construído. Rio de Janeiro: Rio- Books, 2021.

PEDRO, N. Ambientes educativos inovadores: o estudo do fator espaço nas ‘salas de aula do futuro’ portuguesas. *Revista Tempos e Espaços em Educação*, São Cristóvão, v. 10, n. 23, p. 99-108, 2017.

Available from: https://periodicos.ufs.br/revtee/article/view/7448. Access on: Sept. 1, 2025.

PEREIRA, B. C. *A certificação do bem-estar como motor da valorização:* WELL Building Standard e seus modos de operação no espaço urbano brasileiro. Monografia (Bacharelado em Arquitetura e Urbanismo) – Centro Tecnológico, Departamento de Arquitetura e Urbanismo, Universidade Federal de Santa Catarina, Florianópolis, 2024. Available from: https://repositorio.ufsc.br/han- dle/123456789/258715. Access on: Sept. 1, 2025.

SANTOS, A. A. A. L. *Neurociência aplicada à arquitetura:* a influência espacial no ambiente hospita- lar. Monografia (Bacharelado em Arquitetura e Urbanismo) – Universidade Federal de Pernambuco, Recife, 2023. Available from: https://repositorio.ufpe.br/handle/123456789/51134. Access on: Sept. 1, 2025.

SUGAHARA, E. S.; FREITAS, M. R.; CRUZ, V. A. L. Análise das certificações ambientais de edi- ficações: Aqua, Procel, Leed e Casa Azul. *Interação ␦ Revista de Ensino, Pesquisa e Extensão*, Varginha,

v. 23, n. 1, p. 12-24, 2021. Available from: https://www.periodicos.unis.edu.br/interacao/article/

view/285. Access on: Oct. 19, 2024.

WORLD HEALTH ORGANIZATION. *WHO COVID-19 Dashboard*, 2022. Available from: https://covid19.who.int/. Access on: Feb. 1, 2022.

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Authors' Contribution

Both authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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