

# HOW INCLUSIVE DESIGN EDUCATION PRACTICES CAN MOBILISE STUDENTS' COMPETENCIES IN HEALTH-RELATED HIGHER EDUCATION

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## ABSTRACT

Inclusive design education is a fundamental issue to be worked on with health-related students from health-related courses to respect the society diverse. By embedding inclusive design into educational practices, health institutions can equip students with competencies to create equitable and accessible health products and services. However, inclusive design remains underrepresented in health-related higher education curricula, which often overlook its integration into subjects. This gap hinders students' preparation to work effectively with diverse Brazilian populations. So, this study explores how inclusive design education practices can mobilise students' competencies in health-related higher education. It identifies strategies to prepare students as ethical and respectful professionals, capable of addressing the needs of diverse populations. Employing a qualitative approach, the research gathers insights from educators, researchers, and students in health-related fields. These perspectives illuminate the current teaching of inclusive design and reveal opportunities for improvement. Findings indicate that while the theoretical importance of inclusive design is recognised, students lack practical understanding and require support to develop related competencies. Experiential learning opportunities linking inclusive design theory with real-world health contexts are crucial. Systematic incorporation of inclusive design practices into curricula can significantly enhance students' abilities. This not only prepares them to provide inclusive care but also contributes to broader social and healthcare advancements, fostering a generation of health professionals adept at addressing diverse needs.

*Keywords: Design education practices, inclusive design, competencies, health-related higher education*

## 1 INTRODUCTION

In general, undergraduate programmes in the health field—such as Nursing, Medicine, Medical Physics, and Health Management—have not included courses focused on inclusion and diversity in their curricula. This study presents the experience of students from a health-related programme who took a course titled *Accessibility in Health*, focusing on user-centred design. The absence of such courses in university curricula contributes to classrooms remaining exclusionary. Thus, acts of injustice, exclusion, and discrimination within educational environments remain critical issues in university contexts. Advancing toward a more inclusive and diverse society requires new ways of thinking, behaving, and acting, with the aim of promoting education for all. This aligns with the United Nations (UN) initiative on the Sustainable Development Goals (SDGs), primarily focusing on Goal 4 (Quality Education) and Goal 10 (Reduced Inequalities) [1].

Taking the Brazilian context, universities receive diverse students. However, in some Brazilian educational contexts, what is still observed are regular classrooms, as Wilson also points out in his article "(...) constructed for a nondisabled, neurotypical, white, male, middle-class 'norm' that neither reflects nor accommodates the wide range of diverse learners." [2]. To overcome these regular classrooms there are some laws, standards, and policies (LSP) that can be mentioned. These include the Law of the Inclusion of People with Disabilities No. 13.146/2015 [3], the NBR9050/2020 standard [4], which addresses accessibility to buildings, furniture, spaces, and urban equipment, Law No. 10.098/2000 [5] which concerns the Law of Promotion of Accessibility for People with Disabilities or Reduced Mobility, and the Law of Guidelines and Bases of National Education No. 9.394/1996 [6]. Bohn et al. [7] affirm

these Brazilian laws and standards apply the principles of inclusive design (ID), aiming to promote accessibility and inclusion. Also, the NBR9050/2020, in its latest update in 2020, incorporated the principles of universal design (UD) to guide projects.

In this sense, studies in health education use design concepts and methods, such as: universal design, inclusive design, co-participation, co-creation and co-design [8][9][10][11]. These approaches have proven to be effective ways of engaging with those directly involved, respecting diverse voices, and ensuring assertiveness in final proposals. From them, there is an increase in visibility, empathy and inclusion of students' multiple realities. This is because they foster connections between students with disabilities and those without, leading to the sharing of experiences. The aforementioned design practices call on students to be co-creators, generating improvements in educational processes. Co-creation initiatives involving local communities have demonstrated success in reducing cultural and economic barriers, as evidenced by UNICEF [12] — barriers that are also found within universities. Sanders and Stappers [13] add that co-creation is an act of collective creativity, that can be shared by two or more people, involving different participants contributing their experiences, knowledge, and creativity. Also, the disability rights movement 'Nothing About Us, Without Us' advocates for the involvement of people with disabilities or reduced mobility in the planning of strategies and policies that impact their lives [14].

In university environment there is a big challenge for educators that is to be aware of their students' individual differences and make sure no one is excluded [2]. Those involved in universities need to have individual competencies to work and engage in this context. In this study, individual competencies are understood as knowledge, abilities, and attitudes [15][16]. In terms of knowledge, specific, technical, organisational, and practical knowledge can be mentioned. As for abilities, they encompass the capability to apply knowledge in practice, such as creativity, strategic and systemic thinking, and communication. Lastly, attitudes can be defined as the ability to act effectively. Examples include commitment, results-oriented focus, self-confidence, relationship-building, and problem-solving. In the context of healthcare, students are expected to have specific competencies related to inclusion, equity, and diversity to respect and take care of patients.

Considering this, this study aims to explore how inclusive design education practices can mobilise students' competencies in health-related higher education.

## **2 METHODOLOGIES**

This study is an experience and descriptive report, following a qualitative approach, based on classroom co-creation [13] and problem-based learning [17] activities that result in experiences, insights, and lessons learned by researchers, professors, and students at the Federal University of Health Sciences of Porto Alegre (UFCSPA) in Brazil.

### **2.1 Health university context and barriers presented**

UFCSPA is a university specialised in health programmes. The university has 16 undergraduate programmes, 64 medical residency programmes, four professional health area residencies, nine specialisation courses, and 12 *stricto sensu* graduate programmes, all in the health field [18]. 50% of the student vacancies are destined to individuals who have completed high school in public schools and for students from low-income families. UFCSPA is supported by the Brazilian government through a programme that offers vacancies to students from developing countries in Africa, Latin America and Asia. Low-income students have support of food, transportation, housing and school materials [18]. Nowadays, UFCSPA has 4.250 students, 400 professors, and 200 technical staff.

The university has an Inclusion and Diversity Committee (NID), which is responsible for monitoring and providing support to students, as well as developing activities, programmes, policies, research, and projects related to the DEIA theme. Despite ongoing efforts and initiatives to promote inclusion and accessibility, the educational environment still presents various physical, technological, informational and communication, attitudinal, methodological, and instrumental barriers.

### **2.2 Activities performed and students' profile**

The activities are developed in the course entitled Accessibility in Health, with 45 undergraduate students (1<sup>st</sup> year) at UFCSPA. The classes were divided into three activity modules. Initially, more theoretical lessons were proposed, covering concepts of design, inclusive design, universal design, and DEIA, as well as laws, regulations, and policies in healthcare. Various types of disabilities, their

characteristics, barriers, and the challenges faced by people with disabilities were also addressed. Also, exercises, readings, and debates were proposed throughout this phase.

In the second module, an exploratory phase was introduced, followed by a workshop and a practical activity for the final proposal. In the third and final module, a concluding discussion was held, and the proposed action plan was submitted to the university's rectorate.

Throughout these activities, various members of the university community participated, including students with disabilities or reduced mobility, as well as those who had already approached the NID with specific requests for support. These activities were conducted by the course professor, a guest professor, and a volunteer researcher. In certain specific actions, members of the NID also participated.

### **3 RESULTS AND DISCUSSION**

As an experience report, the results and discussion were structured in three categories: classroom experiences with co-creation activities, individual competencies, and strategies and opportunities for inclusive practices in health-related higher education.

#### **3.1 Classroom experiences with co-creation activities**

In the first part of the course, we started with a sensibilisation to the theme in question, with the aim of bringing students closer to the topic and providing them with a theoretical foundation. Professors covered theories such as concepts of diversity, equity, inclusion, and accessibility (DEIA), principles of universal design and inclusive design [19], as well as Brazilian laws, standards, and policies, such as: NBR9050/2020 standard [4], Law No. 13.146/2015 [3], Law No. 10.098/2000 [5], and Law No. 9.394/1996 [6]. For all theoretical classes, there were content reinforcement activities, such as regular debates, case analyses, and exercises. Group work was also carried out, including presentations and an interview with a person with a disability. We invited people with disabilities to start their participation in some of the forum discussions and debates, sharing their experiences of life. In the beginning, not all students appreciated having other people interacting in discussions and bringing to table their reality and new ways of thinking.

In the second part, a practical activity was conducted in which students simulated the experience of 'putting themselves in someone else's shoes.' Groups were formed based on the students' autonomous organisation. Each group was given the challenge of facing the daily difficulties experienced by individuals with physical and visual disabilities on the university campus. The task consisted of navigating the campus using wheelchairs, crutches, and blindfolds, in order to create a practical understanding of the limitations present in the university environment. After the practical activity, a reflection session was proposed for the whole group, including community members.

At this stage, through the unfolding of reflections generated by the practical activity, the students were able to perceive forms of exclusion related to disabilities, gender, race, age, social class, language, and nationality. In this part of the course, students became more involved in different realities and a real engagement occurred in the activities. At this stage, the challenge of involving students in the process in a way that was appropriate to their participation capacity was observed, bringing applicable domain theories in a way that could be handled by researchers and teams [13]. The third part was a workshop where students are stimulated to reflect in action [20], co-creation with members of the community, and discuss, in order to make a report before the final proposal. Students mapped barriers and opportunities in university setting and planned how issues could be addressed and what actions and priorities could be proposed. All the groups' reports were discussed and adjusted with all the participants before the final version of the proposal to be submitted to the NID and the university administration. The final proposal was a document with guidelines and suggested actions to overcome barriers and foster an inclusive educational environment for all. Changes were made to the physical structure, including the installation of access ramps, adjustments to doors and hallways to allow wheelchair passage, and the inclusion of appropriate signage for spatial orientation. In addition, awareness-raising interventions were carried out within the academic community, such as workshops and training sessions. Furthermore, improvements in institutional communication were suggested, including various informational formats such as Braille, audio, subtitles, and enlarged text. The document was formatted as an action plan for UFCSPA. Finally, the recommendation made by the students who co-created this plan consisted of implementing a system for continuous monitoring and evaluation of accessibility barriers within the university, considering that with the arrival of new students, new accessibility needs also emerge.

### 3.2 Individual competencies

Some individual competencies were developed throughout the course. Throughout the activities, it was possible to perceive - through the remarkable strengthening of student agency in the proposed activities - the generation of knowledge as well as the development of new abilities and the stimulation of certain attitudes. Based on the accounts of real-life experiences shared by students with disabilities, contrasted with the experiences of students without disabilities, the latter demonstrated empathetic skills and attitudes. They began to interpret the university context with a more critical perspective, considering the potential challenges faced by students with disabilities and showing proactivity in reflecting on accessibility issues and possible solutions.

Regarding knowledge, it was possible to observe the advancement of the generation and development of theoretical, technical, and practical knowledge, such as: aspects of disabilities; DEIA concepts; laws, standards, and policies; design concepts, principles, methods, techniques, and approaches; roles of health professionals to foster a more inclusive society. The co-creation activities that related concepts, methods, and design approaches contributed to the process of acquiring and generating new knowledge. The nature of the co-creation activities focused on group exploration of university environments, simulating the limitations experienced by individuals with physical and visual impairments. Students took on the role of co-creators by identifying accessibility barriers and subsequently reflecting on and collaboratively developing relevant solutions to promote inclusive access across all campus spaces. The proposed changes were driven by the perspectives shared by students with disabilities who participated in the classes. The design can be an agent of knowledge to promote innovation [21] or a complex activity that generates new knowledge and integrates heterogeneous knowledge [22]. Belkadi, Bonjour, and Dulmet [22] add that competencies can be activated based on qualitative characteristics of work situations and emphasise the connections between competencies, knowledge, and context. Table 1 summarises the students' individual competencies, categorised into knowledge, abilities, and attitudes.

*Table 1. Students' individual competencies*

Knowledge	Theoretical and technical knowledge regarding: Disabilities; DEIA concepts; Laws, Standards, and Policies; Design concepts, principles, methods, techniques, and approaches; Roles of professionals of health to foster a more inclusive society.
Abilities	Creativity; Design possible scenarios; Systemic thinking Design focusing on inclusive education for all; Understanding the context and the users' specificities.
Attitudes	Empathy; 'Put yourself in someone else's shoes'. Proactivity; Community values; sense of community. Being participative in community actions. More sensitive and ethical interaction.

According to Konig-Klever et al. [23], by developing these competencies, we could re-think curricula and support educators and students in their teaching-learning process. Authors also add that the competencies focused on DEIA aspects can be more assertive and strategic by guiding curricula, developing Brazilian professionals, and, ultimately, improving educational environments and healthcare services and outcomes.

### 3.3 Strategies and opportunities for inclusive practices in health-related higher education

Throughout the work developed, some strategies and opportunities became evident. The first, is the extreme relevance of involving members of the academic community, with multidisciplinary expertise [13], as well as people with disabilities [11] in the planning of strategies and policies for the university setting that impact their lives and promote an inclusive education for all. This first strategy is based on the design premise of including users of spaces/services in the co-creation of changes.

Another strategy is to identify leaders or ambassadors to spread and advocate for inclusion in the university setting and build groups and communities of people to spread these beliefs. One more action is the monitoring of possible physical, technological, informational and communication, attitudinal, methodological, and instrumental barriers in order to think about how to overcome them. Identifying

incoming students who require support is equally significant, and they should be monitored and accompanied by more experienced peers, such as senior students, programme ambassadors, and NID. Insertion of design concepts and approaches in the curricula of health-related courses also proved to be an effective and innovative strategy. Design practices can promote engagement, a sense of community, and critical thinking among students. This action can help “to form new discourses that have the potential to radically transform restrictive ideologies and institutions and that create new, multiple understandings of the 'right' way to see, hear, think, and know” [2]. Another strategy is to conduct mapping of students' competencies before and after participating in design practices to measure the impact of these activities. Also, developing inclusive competencies in the professors through faculty training could be another good opportunity. Finally, the support of chancellors, provosts, and heads of universities is essential for the successful implementation and sustainability of inclusive educational and design practices in the university. Bohn et al. [7] add that long-term and ongoing actions at different levels of implementation and management must be taken to provide a more comprehensive understanding of design practices regarding inclusion in healthcare environments.

#### **4 CONCLUSIONS**

This paper aimed to explore how inclusive design education practices can mobilise students' competencies in health-related higher education. Based on this, some insights and lessons learned can be inferred from the activities carried out. The first one concerns the real purpose of the activity, which had to be worked on and emphasised throughout the course. The purpose is to discuss the creation of a university environment with education for all, ensuring that no one is left behind, and not viewing students with disabilities as a problem to be solved. Thus, the question is not how we will accommodate students with disabilities in the university environment, but rather how we will reimagine education for all - and in this sense, design emerges as a powerful tool for co-creating inclusive education. It was important to clarify that the failure was not with people with disabilities, and that the failure of inclusion in universities was not the students with disabilities responsibility. The failure lies in the inadequacy of the educational environment.

Second, it was possible to observe that, through co-creation activities and the building of knowledge together, participants developed a more inclusive sense of belonging as part of the university community. For people with disabilities, there was a sense of empowerment and belonging, with the real possibility of being heard and having their needs recognised and respected.

Regarding competencies, throughout the course, it was noticeable the progress made by the students in technical knowledge, as well as in their understanding of the community and the university context they are part of. More inclusive and empathetic attitudes were observed throughout the course, along with more sensitive and ethical abilities to interact with and live the university environment.

This work led to the understanding that the design methodology had an impact on the students' learning processes. This was reflected in their engagement, which fostered attitudes of change and empathy. This was consolidated in their critical reflections on the need for more disciplines in health curricula to promote discussions and practices centred on inclusion. Finally, it became clear that, at various moments, the participants made connections and extended their comments to contexts beyond the university setting, demonstrating a larger collective understanding moving towards a more inclusive, diverse, equitable, and accessible society.

A limitation of this paper is that the activities were conducted in only one course and involved a limited number of members from the university community. Future studies could explore other health courses and broader audiences, such as master's, doctoral students and residents, also involving other staff members from the university's organisational structure. Other suggestion is to explore collective and organisational competencies in university context.

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