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Competencies related to Diversity, Inclusion, and Accessibility for health students with a design approach: An experience report

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Abstract: Inclusion, diversity, and accessibility concepts still need more in-depth work in curricula of health universities courses. In addition, the approaches used in classrooms at Brazilian universities are not effective in developing alumni individual competencies to live in and to be part of an inclusive society. However, in health organizations, design concepts and methodologies have proven to be great allies in rethinking and redesigning new services, processes, and routines. So, this paper aims to discuss the development of competencies related to diversity, inclusion, and accessibility with a design approach for master students in a health university. The proposed study is an experience report based on experiences of professors during three months in a subject with master students. It describes the interactions and didactic activities with a design approach utilized during the subject with students. The paper results emphasize the process and how didactic activities collaborate to develop and mobilize student individual competencies.

Keywords: Design for Health, Diversity, Inclusion, Accessibility, Education, Competencies

1. Introduction

Much progress is currently taking place in discussions about diversity, inclusion, and accessibility in all spheres of knowledge, because these are issues that directly influence increased innovation, productivity, and performance, influencing business, the economy, and global social development (ILO, 2022). Companies, institutions, and communities have come together to discuss diversity, influenced by the 2030 Agenda of the United Nations (UN), which seeks among its sustainable development goals, universal respect for human rights and human dignity, valuing diversity and equal opportunities for all people (UN, 2023).

Given this, it becomes important to understand the concepts of diversity, inclusion, and accessibility, so latent and crucial for the sustainable development of the world. Diversity, as a theoretical paradigm, is related to human differences (Kirton & Greene, 2022), having emerged in social

movements among people who feel oppression based on belonging to a group (Vertovec, 2012). Regarding accessibility, its definition is related to the quality of being able to be reached or entered, being easy to obtain or use, and being easily understood or appreciated. Inclusion, on the other hand, is related to the practice or policy of providing equal access to opportunities and resources for people who could be excluded or marginalized, considering people belonging to minority groups and in a situation of vulnerability in society (Oxford English Dictionary, 2023). Thus, there is a relationship between the three concepts, with accessibility being necessary for inclusion to occur, allowing different groups in society to have access opportunities.

In the context of Brazilian health, the concepts of diversity, accessibility, and inclusion are particularly important, because the country has The Unified Health System (SUS) - the Brazilian public healthcare system, which was designed to cover primary and complex care in all regions. Among the principles of SUS, universality, integrality, and equity stand out. These principles are related, respectively, to access for all people, to serve people in all their needs - with an articulated and continuous set of preventive and curative actions and services -, and to healthcare without prejudice or privileges of any kind (Organic Health Law, 1990).

Brazil also has laws and regulations that should govern the functioning of the various existing services, such as the Law No 13.146 - destined to assure and to promote, in conditions of equality, the exercise of the rights and of fundamental freedoms for people with disabilities, aiming at their social inclusion and citizenship (Law for the Inclusion of People with Disabilities, 2015) - and the Brazilian Standard of Technical Standards 9050, which regulates accessibility to buildings, furniture, spaces and urban equipment (NBR 9050, 2020). However, despite all efforts to include people, the Brazilian federal constitution ensuring that health is everyone's right and duty of the State, and the existence of the SUS as a universal system for accessing healthcare, many inequities are noted, and many people, especially in more vulnerable situations, struggle to access quality health services (Garnelo et al., 2020).

In this context, the importance of an attentive look at inclusive design arises, which consists of an assertive design concept in the search for solutions concerning inclusion and accessibility, seeking to contemplate the greatest number of people possible in proposing solutions (Pattison & Stedmon, 2006). More than that, it is important for inclusive design concepts to be present in the curriculum of universities, so that accessibility is worked on in greater depth in the education of future professionals (Putnam et al., 2016). The literature has also shown how beneficial the inclusion of diversity, inclusion, and accessibility topics in the teaching curriculum of health professionals can be, so that they are more prepared to deliver the best quality of care for diverse patients' needs and characteristics (Trentham et al., 2007; Verbree et al., 2023). Competency-based education is a developing approach to health professions education (AAMC, 2022). Brazil has education guidelines that seek to ensure universities, in the exercise of their autonomy, organize education and higher education programs (Law of Guidelines and Bases of National Education No. 9.394 of 1996).

Understanding the university as a competency-forming institution (Issakova et al., 2021), and competencies as a set of knowledge, abilities, and attitudes - human capabilities that justify high performance for a given function (Fleury & Fleury, 2001; Ruas, 2005) -, it is understood that universities that invest in curricula focused on aspects of diversity, inclusion, and accessibility, are investing in competencies to deal with different people, needs, expectations, and characteristics, which are precisely the characteristics of inclusive design when applied to the health context (Liu, 2018; Nörnberg & Forster, 2016; Pugh & Lozano, 2020). Loufrani-Fedida and Angué (2009) point out that individual competencies are built considering knowledge (to know) and practical experience (know-how-to-do and/or know-how-to-act), being grounded by behavior (know-how-to-be). So, this

paper aims to discuss the development of competencies related to diversity, inclusion, and accessibility with a design approach for master students in a health university.

2. Method

This paper is an experience report that aims to discuss the development of competencies related to diversity, inclusion, and accessibility with a design approach for master students in a health university. It refers to a descriptive report of a qualitative approach. We conducted a literature review and then, some concepts and aspects arose and needed to be well discussed. The intention with these didactic activities is to explore and mobilize some student individual competencies that are determinant to understand the importance to promote inclusion and accessibility and better act for an inclusive society.

The discussion of this study was based on the discipline of Design and Accessibility offered in the Graduate Program in Information Technologies and Health Management (PPGTIGSaúde) at the Federal University of Health Sciences of Porto Alegre (UFCSPA). UFCSPA is a higher education institution that was founded in 1961, being a medical school until 2004, to later become a health university. Since 1988, it has had a master's program and, later, it also began to offer doctoral programs. Today, in addition to 16 undergraduate courses, UFCSPA has 64 Medical Residency programs, four Multiprofessional Residency programs, nine Specialization courses, and 12 *Stricto Sensu* Graduate programs. PPGTIGSaúde, which is the focus of this research analysis, emerged in 2017 and consists of a multidisciplinary graduate program, which brings together professionals from different areas of health to study health management and information technologies for healthcare. The Design and Accessibility discipline is offered every year, during three months, with an optional character and can be taken by students from other programs (UFCSPA, 2023).

The design approach used in the classes was inclusive design (Persad, Langdon & Clarkson, 2007), since the discipline was focused on aspects of accessibility, diversity, and inclusion in the context of health, in particular health services. Students started from a general knowledge of design as a way of understanding multiple and complex needs to project solutions and services that are able to supply them (Lin et al., 2011). Later, the context of accessibility was introduced (the reality and problems of Brazilian health services regarding accessibility and laws supporting this) and, in this way, the concepts of inclusive design were presented as a way of designing services that include as many people as possible, according to the needs of elderly people, people with disabilities, people with reduced mobility, among others.

The Problem-Based Learning method aims to make students capable of building their knowledge in conceptual, procedural and attitudinal ways by posing problems that will introduce them to situations designed to motivate them and prepare them for the working world. According to Pereira (1998), for learning to occur, it must necessarily be transformational, demanding from the teacher an understanding of new meanings, relating them to previous experiences and the experiences of students, and allowing the formulation of problems that stimulate, challenge, and encourage new learning. In this context, the possibility of applying problem-based learning (PBL) arises, with the purpose of helping the student gain knowledge of the theoretical content, strengthening his ability to solve problems, and involving him in learning (Levin, 2001).

In the sense, during classes, some aspects were observed, related to the knowledge acquired through the discipline, skills developed through this knowledge, and attitudes evidenced in each student in the execution of activities, discussions, and exchanges among students and between students and professor. These observations were noted by the professor in each class, in order to form a compilation of data, which were analyzed through pre-defined thematic categories (Braun &

Clarke, 2014): overview for health master students; didactic activities in classroom; health students' competencies; health students' knowledge; health students' abilities; and health students' attitudes.

3. Results and Discussion

The following results are organized as an experience report, and categorized into overview for health master students, didactic activities in the classroom, and health students' competencies.

3.1 Overview for health master students

Students in this master's program of information technology and health management have a professional profile at the beginning of careers, working mainly in hospitals and health clinics in the southern region of Brazil. Their base background is in business management, production engineering, nursing, physiotherapy, medicine e biomedical informatic. This subject occurred in 2022, online and in person, during one semester, and ten students were enrolled in it.

In general, there was a resistance of students in the health area to take seriously and apply topics such as innovation or design in health. Furthermore, there is also resistance in dealing with difference, in understanding the importance of promoting inclusion and accessibility to minimize barriers (physical, behavioral) imposed by society. Concepts and practices focused on the theoretical approach to design and accessibility were also little known.

These aspects are related to the directive teaching-learning approach, used in the basic training of students, in previous educational levels. Implementing a constructivist approach in this context requires the student to move from a passive model, where the teacher speaks and the student reproduces, to an active model, where the student centralizes the learning process within himself (Custodio et al., 2013). This requires a culture change, which causes resistance and discomfort at first experience.

Furthermore, studies show that health professionals' perceptions of the needs, lives, and desires of patients with disabilities are poor, particularly when the professionals have limited exposure to people with disabilities other than patients. This further limits the view on diversity, inclusion, and accessibility in health, corroborating with previous studies (AAMC, 2018).

3.2 Didactic activities in classroom

The subject had a total of 30 hours and was divided into 10 meetings of three hours each. Central concepts of diversity, inclusion, accessibility, and design for health as well as practical examples of well succeeded applications of design for health were exposed. The subject also provided lectures by specialists, Brazilian documentaries about people with disabilities, exercises with case studies and provided an opportunity for a field visit to learn in loco and face the reality of an environment of a large hospital in the city. The following aspects are related to the teaching-learning methodologies used in the classes in order to foster competencies related to diversity, inclusion, and accessibility. Figure 1 presents the scope of these methodologies.

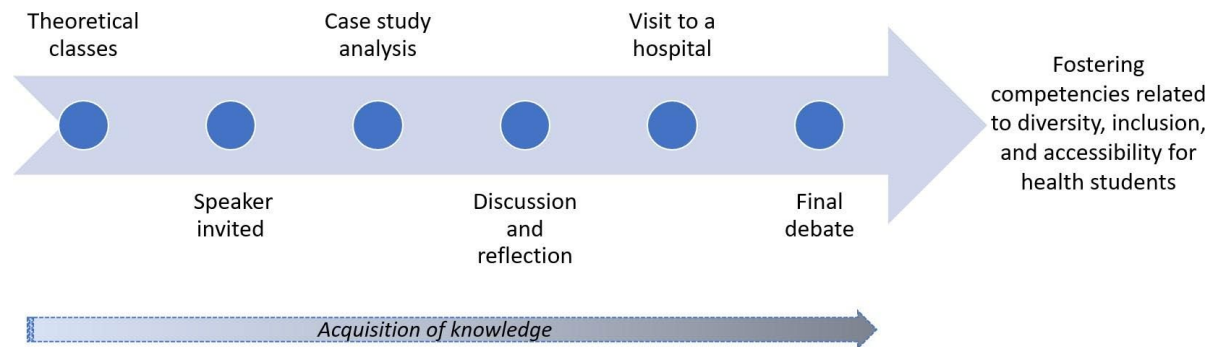


Figure 1: Teaching-learning methodologies used.

After the professor and students introduced themselves, as well as the subject's teaching plan, the students were asked if they knew anyone or had family members, friends or colleagues close to them with a disability or reduced mobility. Some students made comments and exposed situations they had already experienced and limitations of some people they knew. Then, the professor began to expose concepts of inclusion, diversity, and accessibility as well as regulations that guarantee access for all people, without discrimination - NBR 9050/2020 and Law n. 13,146. As they are students related to the healthcare sector, relationships were made with the Brazilian healthcare system and with public and private healthcare organizations. So, this first class aimed to make students aware of the theme subject and encourage them to put themselves in the other's shoes. This awareness on the subject was carried out, because empathy is essential for teaching accessibility and for better solutions to be proposed, based on the needs of users (Putnam et al., 2015).

In another class, a speaker was invited to participate, reporting his experience with design for health and illustrating his speech with examples of design for health projects already applied in national and international health organizations. The students interacted and showed interest and curiosity in the cases presented. The literature points out that bringing experts into the classroom, in order to generate practical discussions with students, is one of the strategies that increase student engagement, motivation and creativity (Beghetto & Kaufman, 2014).

The next class aimed to expose the Brazilian context of health and the current Brazilian norms. For example, in Brazil, there is NBR 9050, revised in 2020, which deals with accessibility for products, services, public spaces, urban furniture, buildings. In 2020, when this standard was revised, universal design principles were included. From what was seen in the previous class and the presence of design concepts in a Brazilian standard, the next class addressed concepts of design and accessibility to start and guide the discussions. Also, images were displayed with situations that showed non-accessible environments, products, urban furniture to instigate discussions.

In a following class, after the students had acquired knowledge about the various subjects of the discipline, an exercise was proposed in which they should exercise critical thinking about what is applicable to the Brazilian reality, about what includes or excludes users of the health and what are the barriers faced by users of the health system. The students were encouraged to think precisely at a time when they had already been sensitized on the subject, either through class discussions or through presentations of cases from the Brazilian service. This strategy promotes more interaction with the student by providing brainstorming, problem-based learning, using real-word experiences, collaborative learning, and discussions (Okolie et al., 2021).

After exercising and debating the proposals, students visited a hospital that serves 60% of SUS and 40% of private patients in the south of Brazil. Wards of a new hospital under construction were visited. It was possible to visit rooms, bathrooms, environments for urgent and emergency care, spaces for patients with suspected covid, as well as environments for patients and employees

circulation and support sectors such as the storage and dispensing of medicines. The students were encouraged to have a look at the accessibility points and possible barriers that the environment may impose on users. The students' eyes at that time were already much more trained to see problems of accessibility and opportunities for the design of inclusive health services. This was built up throughout the entire discipline.

At the last moment, there was a closure of the discussions, carrying out a rescue of what was worked on throughout the discipline. Students were asked to reflect on how they started the course and how they were finishing it. There was also a final debate, proposed by a student, related to a reflection on ways to promote inclusion and accessibility, not only in physical or digital environments, but also in a behavioral way, aiming at a more inclusive society.

3.3 Health students' competencies

By referring to the concept of competencies in this paper, we are dealing with knowledge, skills, and attitudes (Fleury & Fleury, 2001; Ruas, 2005). Current education is inserted in a knowledge society, which is quite restricted, from the viewpoint of science, unlike the information society (Fleury & Fleury, 2001). However, knowing this historical and contextualized production relationship generates a need to go beyond information in order to generate autonomy and learning capacity that enables the individual to generate solutions in the face of market demands. This vision of knowledge management works with the way of producing knowledge, under different visions and in the context in which it was developed, and not just the information itself, which requires capacity for analysis and logical transformation of information in context (Nörnberg & Forster, 2016).

From this perspective, the objective of the course was to learn concepts, methods, practices and tools for diversity, inclusion, accessibility, and design in health. From expository and dialogic classes, students were encouraged to reflect and have a critical view of situations faced by people with disabilities or reduced mobility, and how Brazilian society is structured to receive these people.

Practical activities, exercises, case studies and a technical visit were also proposed so that students could understand, through real examples, what was being exposed in class.

This approach refers to a higher education that manages to provide the professional with a vision capable of executing knowledge in the reality in which he finds himself and requires from the teacher a capacity to teach beyond the existing knowledge, but of its production and applicability to the reality of each individual; as well as curriculum updating by universities.

3.4 Health students' knowledge

Throughout the course, specific design knowledge (Ravasi & Lojacono, 2005) in health was worked on as an approach that helps in understanding the different possible ways to promote inclusion and accessibility in the health sector. Concepts of inclusive design were addressed and how they are treated in Brazilian regulations, such as NBR 9050/2020, which deals with accessibility in buildings, furniture, spaces, and urban equipment. The use of evidence-based design in real cases in the health area was also explained.

The students also exposed their explicit and tacit knowledge (Bertola & Teixeira, 2003; van Aken, 2005), as a way of sharing previous experiences and reinforcing a common understanding of the subject. In addition, the course had a lecturer in two classes. This speaker contributed with technical and scientific knowledge (Belkadi et al., 2007). It was also possible to acquire technical knowledge in the practical visit at the hospital, where it was possible to observe aspects of the environment built to receive people with disabilities or reduced mobility. This made it possible for students to bring

their previous knowledge to the subject, the knowledge acquired in class on the subject (with theory, laws and cases) to a counterpoint with reality.

The diversity of teaching-learning methodologies used help the process of appropriation of knowledge by the students (Fleury & Fleury, 2001). However, there was a low involvement of them when using more participatory methodologies.

Higher education faces major challenges in terms of delivering more flexible and autonomous professionals capable of building learning and knowledge management strategies that enable them to live in a society that requires facing new and unpredictable demands. In part, this can be explained by the difficulty of making tangible, in education and training, competencies required by the market in a short period of time. On the other hand, due to the teacher's often limited ability to work information in the form of historical knowledge and contextualized to the logic and reality of the academic profession. And not least, due to the need for higher education, to measure its ability to train and develop competencies in the professional graduate, as well as the alignment of these competencies with market demands (Nörnberg & Forster, 2016).

3.5 Health students' abilities

In one class, students received a case study. They were asked to read, prepare a presentation to the whole group with the case exposition, the barriers encountered and how they could improve the environment through the knowledge acquired in the classes, thus exercising their creative performance (Lee & Cassidy, 2007; Belkadi et al., 2007).

Students were encouraged to exercise strategic and systemic thinking (Brown, 2006), when provoked to think in a systematic way, seeking to include products, services, processes, information and environment in their analyses.

At one point in the subject, an exercise was proposed where students were encouraged to predict market trends, with the aim of analyzing future scenarios. This was also a moment where students discussed future barriers and difficulties for people with disabilities in the health sector. The use of telemedicine and the difficulties that certain users face in its use were much commented on. It was also discussed how we lived during the pandemic, and ways of adapting in similar future situations. It was an interesting exercise as it encouraged students' ability in predicted future scenarios and also in systemic thinking.

3.6 Health students' attitudes

Some students recalled previous experiences with people with disabilities or reduced mobility. They were able to share situations and feelings with colleagues and, in the large group, they discussed ways to promote inclusion and avoid behavioral attitudes of discrimination. The exchange of experiences and perceptions in the large group, especially among the students, was a collective learning and mutual support, and served to reinforce the importance of these practices. Students reported that it was rewarding to exercise an empathetic posture, identifying aspects of the environment and behavior that they had not noticed before.

As they are in a master's program where business concepts in health organizations are discussed, the students were receptive when instigated in tasks related to the development of a proactive (Lauche, 2005), leadership and entrepreneurial (Bertola & Teixeira, 2003; Brown, 2006) profile (although at the beginning they showed resistance to the theme). They were encouraged to reflect on how their work.

environments could be different and how they could be agents of that change. Not only in their work environments, but also as citizens of a society that still needs to be more inclusive and fair. In these moments of debate in the classroom, there was also a movement of understanding that we are citizens living in a society together, and not individuals who are only concerned with themselves (Ravasi & Lojacono, 2005).

So, from the activities carried out, it is possible to highlight some individual competencies, in terms of knowledge, skills, and attitudes, of the master's students that were worked on and mobilized throughout the discipline. Table 1 illustrates students' individual competencies in terms of knowledge, abilities, and attitudes.

Table 1. Health students' individual competencies.

Knowledge	Ability	Attitudes
Specific competencies in design		
Specific skills (competencies in design, inclusive design, and accessibility)	Creative performance	
	Design scenarios	Proactive profile
Tacit and explicit knowledge of individuals	Strategic and systemic thinking	Entrepreneurial character
		Attitudes, values
Technical and scientific knowledge	Predict market trends	
	Predict barriers and difficult for disabled people	Empathic attitude
Inclusive design principles		
Disabilities knowledge		

The need to develop these competencies help educators design or adapt curricula and help educators and learners in their individual professional development. Students entering the healthcare environment are unlikely to have all the competencies developed in advance. The competencies focused on aspects of diversity, inclusion, and accessibility can supplement existing competencies by providing more detail and depth and guide curricular and development Brazilian professionals and, ultimately, improve health care services and outcomes. These practices can be used to qualify the training of health professionals. Examples of intended uses include engaging healthcare professionals in collaborative discussions, conducting gap analysis of curricula, developing assessment tools, among others.

4. Final Considerations

The paper aimed to discuss the development of competencies related to diversity, inclusion, and accessibility with a design approach for master students in a health university. Through an experience report, individual competencies developed and mobilized in students were exposed. In terms of developing these competencies, this report found that students may be used to previous ways of teaching, demonstrating an initial resistance powered by low knowledge about the themes. The constructivist approach used through teaching-learning methodologies is the base to mobilizing students. From that, the didactic activities used were key elements for students to develop certain

competencies in terms of knowledge, abilities, and attitudes, aimed at diversity, inclusion, and accessibility in health. The incorporation of these aspects requires a perpetual effort that requires a robust conversation with educational institutions, professors, and students.

There is considerable value in working on developing competencies related to diversity, inclusion and accessibility with a design approach for master's students at a health university. Actions to enhance this development should be the agenda for future studies, analyzing opportunities, methodologies and results. Especially for Brazilian health, which has many bottlenecks in the inclusion of patients with disabilities, it is important that health professionals are trained with critical thinking in relation to the subject, in order to develop skills capable of transforming the reality of diversity, inclusion, and accessibility in health services.

The main limitation of this study is the fact that it was not a case study, limiting data collection through students' perceptions of the discipline. Future studies could consider interviewing students or applying questionnaires, in order to understand in-depth the competencies acquired through classes.

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