Descriptive Analysis of the Disability Theme in the Federal University of Rio Grande do Norte Undergraduate Degree Curricula[1]

Análise Descritiva do Tema Deficiência nos Currículos de Graduação da Universidade Federal do Rio Grande do Norte

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ABSTRACT: Education may contribute with inclusion of people with disabilities in the society in at least two ways. One is to ensure access, permanence and completion of these people in the education system. The other is to teach people without disabilities to coexist and deal adequately with people with disabilities. The challenge of educating people without disabilities is relevant in undergraduate courses. Thus, this work aims to analyze disciplines of face-to-face undergraduate courses at the Federal University of Rio Grande do Norte – UFRN, Brazil, which address the disability theme. Methodologically, a descriptive documentary study of the university undergraduate curricula was conducted in order to identify which subjects addressed the disability theme between 2008 and 2017. The analysis of disabilities types and themes covered in each discipline allowed us (1) to give an overview of the education offered by UFRN about the disability theme; and (2) to present categories of analysis and forms of data visualization which serve as instruments to analyze the education offered by Higher Education institutions. As results, this preliminary study points out improvement opportunities in the curricula of undergraduate courses at UFRN, mainly through the increasing of the number and diversity of disability types and themes covered by courses. The conclusion is that analyzes and visualizations of information could be carried out with the support of computational systems of academic management, such as the *Sistema Integrado de Gestão de Atividades Acadêmicas* – SIGAA (Integrated Academic Activity Management System). Similar studies can be an important evaluation tool during Higher Education management for the formation of an inclusive society.

KEYWORDS: Disability. Curriculum. Undergraduate degree. Inclusion. Special Education.

RESUMO: A educação pode contribuir com a inclusão de pessoas com deficiência na sociedade em pelo menos duas frentes. De um lado, é preciso garantir acesso, permanência e conclusão dessas pessoas nos sistemas de ensino. De outro, é preciso ensinar pessoas sem deficiência a conviver e lidar adequadamente com pessoas com deficiência. O desafio de formação de pessoas sem deficiência é particularmente relevante nos cursos superiores. Assim sendo, o objetivo deste trabalho é analisar as disciplinas de cursos de graduação presenciais da Universidade Federal do Rio Grande do Norte - UFRN que abordam o tema deficiência. Em termos metodológicos, foi realizado um estudo descritivo documental dos currículos de graduação da universidade para identificar quais disciplinas abordaram o tema deficiência entre 2008 e 2017. A análise dos tipos de deficiência e dos temas abordados em cada disciplina permitiu (1) traçar um panorama geral da formação oferecida pela UFRN sobre o tema deficiência; e (2) apresentar categorias de análise e formas de visualização de dados que servem de instrumentos para analisar a formação oferecida por instituições de Ensino Superior. Como resultados, este estudo preliminar identificou oportunidades de melhoria nos currículos de graduação da UFRN, principalmente por meio do aumento da quantidade e da diversidade de tipos de deficiência e temas abordados nos cursos. Conclui-se que análises e visualizações de informações poderiam ser realizadas com apoio de sistemas computacionais de gestão acadêmica, como o Sistema Integrado de Gestão de Atividades Acadêmicas - SIGAA. Estudos semelhantes podem ser um importante instrumento de avaliação durante a gestão de Ensino Superior para a formação de uma sociedade inclusiva.

PALAVRAS-CHAVE: Deficiência. Currículo. Graduação. Inclusão. Educação Especial.

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1 Introduction

Society is paying more attention to the differences among people in the last decades. These differences, which once excluded subjects and ended up leaving them on the fringe of social and civil activities, are gradually being considered as a natural part of human diversity. They are no longer just a personal problem but also a social issue. It has been better understood that human capacities vary more or less throughout the growth and aging of all people.

Inclusive social movements are making important gains by creating laws that guarantee the rights of people with disabilities. Several countries have ratified the United Nations Convention on the Rights of Persons with Disabilities, including Brazil (Decree no. 186, of July 9, 2008). This and other Brazilian laws (Law no. 13,146, of July 6, 2015) address the inclusion of people with disabilities in their most varied social and civil aspects, such as education, health, work, transportation, culture and leisure. In education, for example, policies for inclusion in Basic Education appeared first, and then for Higher Education. Recently, quotas were created for people with disabilities in the selections for admission to the Brazilian Federal Institutions of Higher Education (Law no. 13,409, of December 28, 2016).

Educational institutions have at least two fundamental roles in the social inclusion of people with disabilities. On the one hand, they need to offer adequate conditions to promote the learning of people with disabilities, analogously to what they offer to people without disabilities. This has been the main focus of practice and research in the area of Special Education. However, there is also the other side. Educational institutions also need to teach people without disabilities to socially and civically live with people with disabilities. This other aspect of Special Education still needs to be further studied and taken care of in Brazil.

During his/her academic education, the future citizen and professional should learn to understand, respect, coexist and deal adequately with the particularities of people with disabilities. Among the strategies for educating people without disabilities to conceive and coexist in an inclusive society, the definition of curricula stands out as a starting point. According to Moreira and Silva (1994, p. 7-8): The curriculum is considered a social and cultural artifact. It transmits particular and interested social visions, the curriculum produces particular individual and social identities. Thus, how do curricula address disability? This is one of the basic questions in the investigation for the formation of an inclusive society.

Although the academic curriculum goes through studies, reformulations and extensions over the years, it is one of the most criticized points of the academic system in almost every instance of teaching. Morán (2015) warns that while the educational system does not incorporate broad discussions, continue to fragment reality and ignore multiplicity and diversity, education will not be fulfilling its role.

In relation to the university, the challenge of motivating teachers remains, involving students and managers in the construction of an education that prepares subjects to exercise their citizenship with the capacity to meet modern demands. To Morán (2015, p. 15):

> A educação formal está num impasse diante de tantas mudanças na sociedade: como evoluir para tornar-se relevante e conseguir que todos aprendam de forma competente a conhecer, a

> construir seus projetos de vida e a conviver com os demais. Os processos de organizar o currículo, as metodologias, os tempos e os espaços precisam ser revistos[4].

In order to establish a liberating and problematizing conception of curriculum, Paulo Freire (1996) leads us to understand that, in the process of integrating contents into the curriculum, it is essential to seek the formation of a dialogical, questioning, reflexive, critical, transforming human being of him/herself and the world. In that sense, including the issue of inclusion and accessibility allows the people without disabilities to prepare to coexist with and deal adequately with people with disabilities and vice versa.

In the scope of Higher Education, there are several researches that investigate how issues related to the disability present themselves in undergraduate curricula (Silva, 2004; Michels, 2005; Costa & Meira, 2009; Paula, 2009; Mazo, 2010; Leite, Borelli, & Martins, 2013). The cutoff of these researches has focused on a course of some universities, such as: Education, Librarianship, Architecture, Civil Engineering and Physical Education. Although these are important visions, they reflect the isolated point of view of some courses. No related and known work has further investigated how an entire Higher Education institution has contributed to the formation of an inclusive society.

The objective of this study was to analyze the undergraduate courses at the Federal University of Rio Grande do Norte (UFRN) – Brazil, which dealt with issues related to disability between 2008 and 2017. The period analyzed represents ten years before the beginning of compliance with the Law on quotas for the admission of persons with disabilities (Law no. 13,409, of December 28, 2016). For each course of the university, it was identified which disciplines were compulsory or optional, and which disabilities and themes were approached. This panorama of undergraduate courses at UFRN is important to continue future research on the university's contribution to the formation of a society, as well as to identify opportunities for improvement in Higher Education curricula and to support academic management. This awareness is fundamental for Brazilian society and the university itself to reflect on the social role of the institution as a whole.

2 Methodology

This exploratory research carried out a descriptive documentary study (Gil, 2008) to investigate the disciplines that address subjects related to disability ten years before the quotas law (2008-2017). The cutoff was undergraduate face-to-face courses at UFRN.

The data collected was about disciplines, curricula and courses offered. These data are public and are available online in two UFRN computational systems: the Open Data Portal (http://dados.ufrn.br) and the public part of the Integrated System of Management of Academic Activities (SIGAA) (http://www.sigaa.ufrn.br). No data used were obtained directly from people.

[4] Translation: Formal education is at a standstill in the face of so many changes in society: how to evolve to become relevant and enable everyone to learn in a competent way to know, to build their life projects and to coexist with others. The processes of organizing the curriculum, methodologies, times and spaces need to be reviewed. (Morán, 2015, p. 15).

The analysis of the data began with the identification of disciplines that approached the theme disability. In March 2018, 17,711 face-to-face undergraduate disciplines (curricular components) were registered at UFRN. Among the attributes of the disciplines, the following stand out at the moment: name, syllabus, objectives, content, competence and skills to be developed and bibliography. This large set of disciplines was reduced to 610 disciplines by querying a database, considering the following keywords in those attributes: *acessi, ajuda%tecni, amputa, asperger, autis, baixa visão, braille, cadeirante, cega, cego, comunica%alternativa, dalto, deficien, desenho%universal, design%universal, dislex, educação especial, for all, hiperati, inclusao, inclusivo, libras, limitac%pesso, necessidade especial, órtese, para todos, parali, pesso%limitac, proj%universal, prótese, scaffold, sindro%down, surd, TDAH, tecno%assisti, transtorno%atenção e transtorno%desen*.[5] One or more of these words with written variations such as written accents, uppercase, and lowercase could appear anywhere in the text of the subject attributes, returning, for example, with the terms *acessível, Acessíveis* and *ACESSIBILIDADE* (accessible, Accessible(s) [plural is possible in Portuguese language], and ACCESSIBILITY. The character "%" has been replaced by any character set in the query, returning, for example, disciplines with the terms: assistive technology and assistive technologies. The researchers then read the attributes of the 610 previously filtered disciplines to identify the 241 disciplines dealing with disability in UFRN. It is worth noting that the definition of the keywords and the identification of these disciplines resulted from a qualitative analysis based on the interpretation of the researchers.

Throughout the reading of the 241 disciplines that deal with disability issues, the researchers also made two classifications in each one: (1) what the types of disabilities are; and (2) the themes (aspects, dimensions or subjects) studied. A discipline has been classified with one or more types of disabilities, and one or more relevant topics. This classification was also a qualitative analysis based on the researchers' interpretation of the attributes that define the discipline (name, syllabus, etc.).

The types of disabilities considered were: visual, auditory, motor, learning, intellectual and autism. When the discipline did not specify the disabilities addressed, treating them in a general way, the type of disability addressed in the discipline was classified by the expression "in general". Learning disabilities included attention deficit disorder or hyperactivity and disorders of language and communication development. Degenerative diseases such as Parkinson's and Alzheimer's, dental prostheses, nor themes involving high abilities and giftedness were not considered.

A wide variety of disability-related topics have been identified in undergraduate disciplines at the university. To facilitate general understanding, they were organized into five groups: services provided, technologies, education, citizenship and people with disabilities.

Services provided to people with disabilities involved: *prevention*, care to avoid loss of capacity (hearing, visual, etc.); *diagnosis*, to identify limitations or losses of capacity, preferably at an early stage to prevent the consequences from worsening; *treatment*, clinical or therapeutic care for people with disabilities; *culture*, provision of accessible cultural services;

[5] The translation of the keywords are: access, aid%techni, amputa, asperger, autis, low vision, braille, wheelchair user, blind (woman and man), communica%alternative, dalto, disabil, design%universal, dislex, special education, for all, hyperati, inclusion inclusive, Libras [Brazilian Sign Language], limitat%pers, special need, bracing, for all, parali, pers%limitat, proj%universal, prosthetic, scaffold, sindro%down, deaf, ADHD, techno%assist, disorder%attention and disorder%desig.

physical, promotion of physical activities for people with disabilities, either to promote the quality of life, or to practice sports (e.g. Paralympic sports); *nutrition*, nutrition of people with disabilities; *personal care*, guidelines on hygienic care for people with disabilities; *evaluation*, verification of accessibility of environments and artifacts; and *development*, affordable software development.

Technologies included: *technology*, as a general category of assistive technologies; and *prosthesis*, for the development and use of prostheses or orthotics for motor disability, excluding dental prostheses.

In education, the disciplines had the following focuses: *education*, for the person with disability him/herself and educational inclusion; *community*, for the education of people without disabilities who coexist with people with disabilities (family, friends, etc.); *teachers,* for teacher training; and *supplies*, for the production of accessible didactic supplies.

Regarding citizenship, the disciplines addressed: *awareness* of society about disabilities and inclusion; *rights* and policies for people with disabilities; *work*, promotion of work or productive activities for people with disabilities; *transportation* of people with disabilities; *architecture*, for building accessible spaces; *Brazilian Sign Language* [called Libras], for the study of the Brazilian Sign Language; and *Braille*, for the study of writing in Braille. Brazilian Sign Language and Braille are part of the citizenship group because Brazilian society considers them as an official mode of communication accessible to certain people with disabilities. When a discipline approached the teaching of Brazilian Sign Language or Braille, they were classified with themes of citizenship as well as education.

In relation to the person with disability, the disciplines addressed: *disability*, to understand the disability and the barriers experienced by the people who have them; *subject*, comprehension of identity, culture, socioeconomic status, discourse, stress conditions, among other characteristics of the person with disability; and *gender*, to study the sexuality of people with disabilities.

After this interpretive classification, the next step was to identify which undergraduate courses contained the 241 disciplines in their curricula. By consulting each of them in SIGAA with their code, all curricula containing the discipline were identified, the year in which they came into force, their course, whether that curriculum was compulsory or optional, as well as equivalent disciplines. Each discipline was counted only once per course even if it belonged to several curricula in force during the period considered. Equivalent disciplines were considered as a single discipline and were therefore accounted for only once per course. In a few cases, a discipline had changed from optional to compulsory or vice versa. In these cases, it was counted as compulsory because, from the point of view of the offer (opportunity of formation), it would be considered as such for many years, as long as there were students associated with that curriculum. A small set of disciplines were not associated with any curriculum. These were considered optional for all university courses and were analyzed separately. In order to obtain an overview of the university, it was also calculated how many disciplines deal with a particular disability theme in all undergraduate courses in the period.

3 Results

Between 2008 and 2017, UFRN planned 197 different disciplines (not counting the equivalent ones) that address the topic of disability. Of these, only four are optional (2%) for all courses, that is, they were not present in any undergraduate curricula of the institution. The university offered 102 face-to-face undergraduate courses and all of them foresee in curriculum at least one discipline involving the subject disability. Each course has an average of 2.7 subjects, of which 1.1 are compulsory and 1.6 are optional.

Figure 1 shows the number of compulsory and optional disciplines on themes related to disability in face-to-face undergraduate courses at UFRN. The number of course disciplines in the capital is represented in circles, and the courses in the hinterland of the state of Paraná in squares. Colored forms represent compulsory disciplines, whereas the blank ones represent optional disciplines. The courses were arranged by proximity of the knowledge area. When a course only exists in the capital of the state, the indication of the offer region was omitted just for simplicity reasons. There was only explicit indication of the region when the course is offered only in the hinterlands of the state and in both (hinterlands and capital).

Eight courses have only compulsory disciplines, all of them related to teaching degrees: in the capital of the state, Biological Sciences, Social Sciences, Philosophy, Physics and History; in the hinterlands, Psychology, Spanish Language and Literature - Portuguese Language and Literature. Fifty-six courses have only optional disciplines. Thirteen courses have the same number of compulsory and optional disciplines; twelve of them with a discipline of each type; and one of them (Physiotherapy in the hinterlands of the state) with four of each. Thirteen other courses have more compulsory than elective disciplines. The remaining ten courses have more elective than compulsory disciplines.

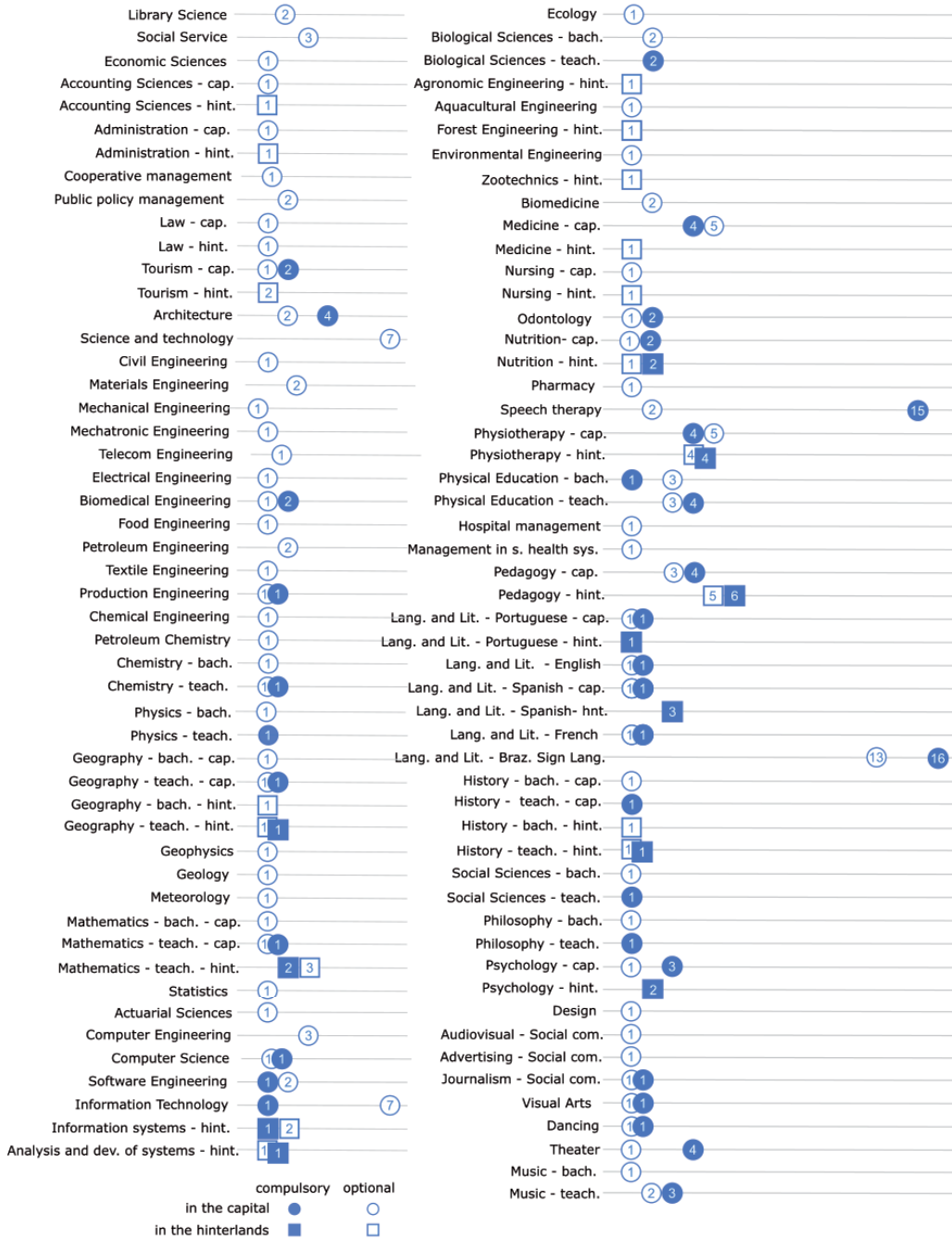

Figure 1. Number of compulsory and optional disciplines on disability in undergraduate courses at UFRN.

Sixteen courses have more disciplines than average (2.7 subjects). They are from physical and mental health areas (Physical Education, Physiotherapy, Speech Therapy, Medicine and Psychology), education (Pedagogy, Teaching Degree in Language and Literature – Sign Language, Theater, Music and Mathematics - hinterlands) and technological (Science and Technology, Architecture and Technology of Information). The highlights were the Teaching Degree course in Language and Literature – Sign Language with 29 disciplines, the Speech Therapy course with 17 disciplines, and the course of Pedagogy in the hinterlands of the state with 11 disciplines.

Courses that have bachelor's degree and teaching degree presented different amounts of disciplines that deal with the subject disability. The courses of Social Sciences, Biological Sciences, Philosophy, Physics and History in the capital of the state defined the same disciplines for bachelor's degree and teaching degree. The difference is that in the teaching degree they are compulsory, whereas in the bachelor's degree they are optional. Others decided to increase their teaching degree courses by adding one more compulsory discipline beyond those in the bachelor's degree. This was the case for the courses of Chemistry, Geography and Mathematics in the capital of the state, and History in the hinterlands. Others went further, adding more subjects in their undergraduate teaching degrees without removing those envisaged in the bachelor's degree, they are: Physical Education, which added three compulsory disciplines; Music, which added three compulsory and one optional discipline; Mathematics in the hinterlands, which added a compulsory and two optional disciplines; and Geography in the hinterlands, which added an obligatory discipline in relation to the capital.

There was no difference in the number of compulsory and optional disciplines of eight courses offered in the capital and in the hinterlands. They are: Administration, Accounting Sciences, Law, Nursing, Geography – Bachelor's and teaching degree, History – Bachelor's, and Nutrition. In addition, there was no difference between courses in Agronomic Engineering and Forest Engineering in the hinterlands, compared to most of the Engineering courses in the capital. Other courses, however, present interesting differences between capital and hinterlands. On the one hand, there are courses with more disciplines in the capital compared to the hinterlands, such as Physiotherapy (+1 opt.), Portuguese Language and Literature (+1 opt.), Medicine (+4 comp. and +4 opt.), Psychology +3 comp. and +1 opt.) and Tourism (+2 comp. and -1 opt. - no offer in the hinterlands). On the other, there are courses with more disciplines in the hinterlands, such as History Teaching Degree (+1 comp.), Spanish Language and Literature (+2 comp. and - 1 opt.), Mathematics Teaching Degree (+1 comp. e +2 opt.) and Pedagogy (+2 comp. and +2 opt.). Among the four courses in the Computing area in the capital and the two in the hinterlands, the Information Technology course offered in the capital also stands out for offering + 5 optional discilplines and -1 compulsory than those offered in the hinterlands.

Figure 2 illustrates the number of disciplines per disability covered in each face-to-face undergraduate course at UFRN. The horizontal bars represent the disabilities in this order: in general, auditory, visual, motor, learning, intellectual and autism. The broader the bar, the more disciplines are provided in the curriculum of that course on that disability. It is important to be reminded that one discipline may specifically address more than one disability and therefore it has been accounted for in more than one bar in such cases.

Figure 2. Number of disciplines in the UFRN undergraduate courses per disability addressed.

By adding all the occurrences in planned disciplines of each type of disability, the courses that most explicitly stated disabilities in their curricula were: Language and literature – Sign Language (30 occurrences), Speech Therapy (25), Pedagogy, in the hinterlands (13), Medicine, in the capital (11), Physiotherapy, in the hinterlands (10), Physiotherapy, in the capital (9), Science and Technology (9), Pedagogy, in the capital (9).

All university courses consider hearing impairment in at least one Sign Language discipline. Only five courses offer other subjects specifically related to hearing impairment. They are: Language and literature – Sign Language (28 disciplines), Speech Therapy (10 disciplines), Mathematics Teaching Degree, in the hinterlands (2 disciplines), and Pedagogy, in the capital and in the interior (2 disciplines each).

Disabilities are generally addressed in 47 courses (45.6%). We highlight: Architecture (6 disciplines), Physical Education Teaching Degree (6 disciplines), Pedagogy, in the hinterlands (7 disciplines) And Information Technology (7 disciplines). When a course addresses disabilities in general, this approach prevails over other types of disability; except in: Speech Therapy and Language and Literature – Sign Language, in which hearing impairment prevails; Physiotherapy, in the capital and in the hinterlands, where motor deficiency prevails; Medicine, in the capital, where motor and intellectual disabilities prevail; and Psychology, in the capital, where autism prevails.

Intellectual disability is studied specifically in eight courses (7.8%): Science and Technology (1 discipline); Biomedicine (1 discipline); Nursing (1 discipline); Pedagogy, in the capital and in the hinterlands (1 discipline each); Physiotherapy, in the hinterlands (2 disciplines); Medicine, in the capital (3 disciplines); and Speech therapy (4 disciplines).

Motor disability is the object of a specific study in seven courses (6.8%): Science and Technology (1 discipline); Biomedical Engineering (1 discipline); Pedagogy, in the hinterland (1 discipline), Speech Therapy (2 disciplines); Medicine, in the capital (3 disciplines); and Physiotherapy, in the capital and in the hinterland (5 and 4 disciplines, respectively).

Learning disability is the object of specific study in five courses (4.9%): Science and Technology (1 discipline); Pedagogy, in the capital and in the hinterland (1 discipline each); Psychology, in the capital (1 discipline); and Speech therapy (3 disciplines).

Autism is also the object of a specific study in five courses (4.9%): Science and Technology (1 discipline); Biomedicine (1 discipline); Medicine, in the capital (1 discipline); Speech Therapy (2 disciplines); and Psychology, in the capital (2 disciplines).

Visual impairment is specifically addressed in only four courses (3.9%): Pedagogy, in the capital and hinterlands (1 discipline each); Medicine, in the capital (2 disciplines); and Music – Teaching Degree (2 disciplines).

No course studies all seven types of disabilities in a specific way. The courses that stand out in the comprehension of the disabilities studied are: Medicine, in the capital (5 types); Pedagogy, in the capital and in the hinterlands (5 and 6 types, respectively); Science and Technology (6 types); and Speech Therapy (6 types).

The number of disciplines that address a particular type of disability also varies depending on where the course is offered. In the capital, the following stand out: Physical Therapy (+1 motor), Language and Literature - Portuguese (+1 in general) and Medicine (+1 in general, +1 autism, +2 visual, +3 motor and +3 intellectual). In the hinterlands, the following stand out: Language and Literature - Spanish (+1 in general), History – Teaching Degree (+1 in general), Tourism (+2 in general), Mathematics - Teaching Degree (+2 in general, +1 auditory), Pedagogy (+3 in general, + 1 motor) and Psychology (+1 learning, +2 autism, -1 in general). When comparing the bachelor's Degree to Teaching Degree, some Teaching Degree courses have more disciplines with specific types of disabilities: Chemistry, Geography, Mathematics, History (+1 in general each), Music (+2 in general, +2 visual) and Physical Education (+3 in general).

Figure 3 indicates the number of disciplines that address disability-related topics for each UFRN face-to-face undergraduate course. The cell becomes darker as the number of disciplines increases. Topics covered in terms of number of courses are Brazilian Sign language (102 courses), teachers (98 courses), law (97 courses), subject (91 courses), disability (32 courses), education (20 courses) and community (16 courses). The first six topics are covered in some Brazilian Sign language disciplines. Teachers, law and disability are also the focus of a significant number of other disciplines. Less topics covered in terms of number of courses are prevention, culture (3 courses each), nutrition, personal care, work, transportation, architecture (2 courses each) and Braille (1 course).

UFRN courses cover an average of 5.4 themes. The courses with the most diversity of themes are: Physical Therapy, in the capital and hinterland (13 and 10 themes respectively); Language and Literature - Brazilian Sign language (10 themes); Science and Technology (10); Theater – Teaching Degree (10); Speech Therapy (9 themes); Teaching Degree in Music (9); Pedagogy, in the capital (9); and Information Technology (9). Courses with less diversity of themes are: Cooperative Management and Tourism, in the capital; and Nursing, Nutrition and Medicine, in the hinterlands (3 themes each).

The four optional disciplines for all university courses cover the following themes: community (1 discipline), culture (1), disability (2), law (1), education (3), Brazilian Sign language (1), teacher (1), subject (1) and technology (1).

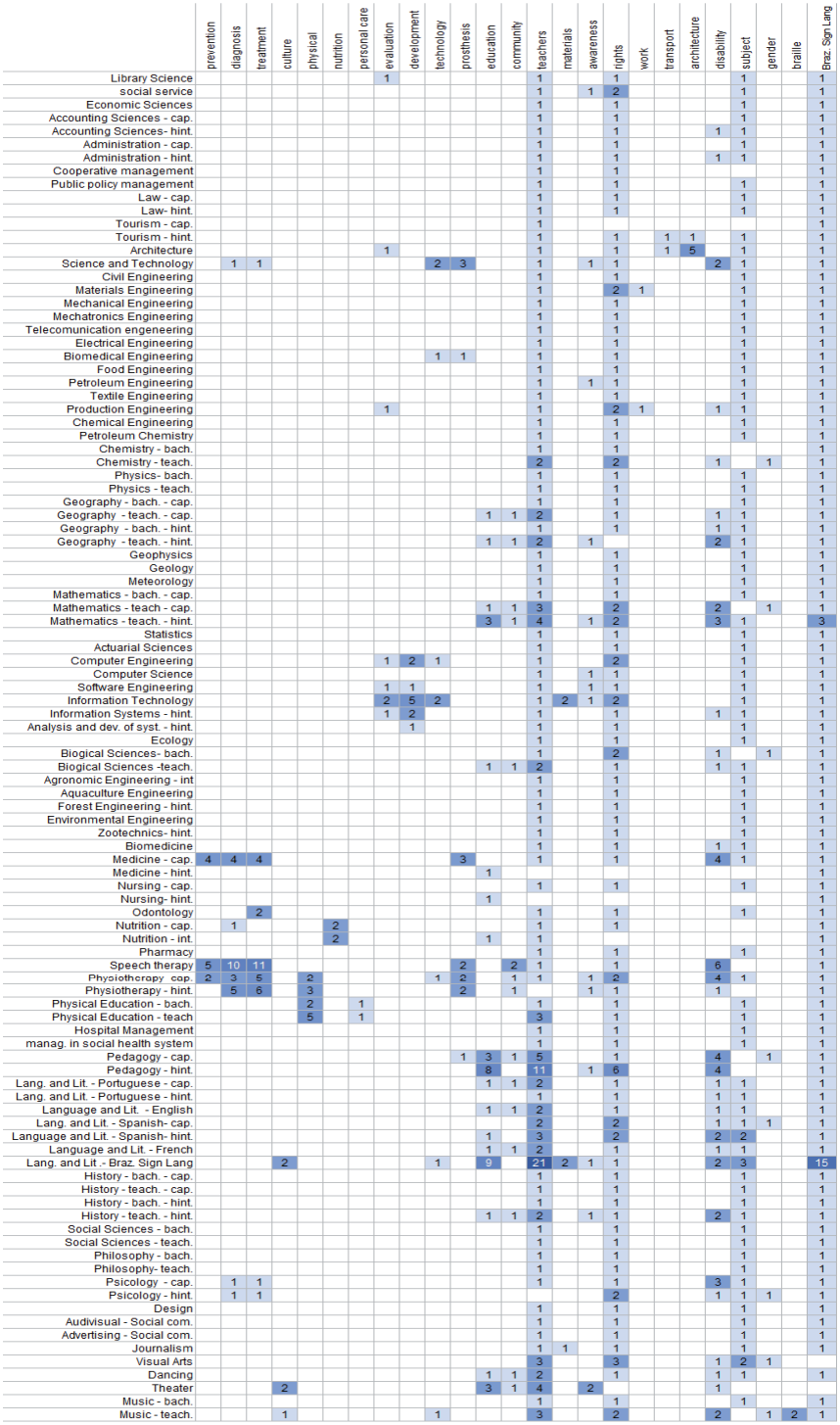

Figure 3. Number of subjects in UFRN undergraduate courses by topic covered.

Figure 4 shows the number of subjects in all UFRN face-to-face undergraduate courses that address a particular theme for a particular disability. The greater the number of disciplines in a given theme, the greater the height of the respective column. The colors indicate the disabilities addressed.

Hearing impairment is studied in 15 (60%) of the themes identified in the five groups. Education is the group of themes with the highest number of occurrences (52) in disciplines about hearing impairment; followed by citizenship (39 occurrences), services (22), people with disabilities (15), and technology (3) groups.

Motor disability is studied in 10 (40%) of the themes identified in the five groups. Here the services group stands out with 32 occurrences in disciplines. It is followed by technology (8 occurrences), people with disabilities (6), education (3) and citizenship (1).

Intellectual disability is studied in nine (36%) of the themes identified in four groups, except citizenship. Again, services stands out with 17 occurrences in disciplines, followed by people with disabilities (12 occurrences), education (8) and technology (1).

Visual impairment is studied in eight (32%) of the themes identified in the five groups. Service stands out again with nine occurrences in disciplines, followed by education (8 occurrences), people with disabilities (6), citizenship (5) and technology (3).

Learning disability is addressed in seven (28%) topics identified in four groups, except citizenship. Services continue to stand out with 11 occurrences in disciplines, followed by people with disabilities (5 occurrences), education (4) and technology (1).

Finally, autism is studied in only three (12%) themes identified in two groups: people with disabilities with six occurrences, and services with five occurrences.

Only the theme groups of services provided and people with disabilities have disciplines that address all types of disabilities. Technology and education theme groups have not been studied in any university discipline for autism. The citizenship theme group was not addressed in any university discipline for learning disabilities and autism.

Only the topics of diagnosis, treatment and disability are addressed for all types of disabilities. Teacher education is addressed for six types of disability except autism. Prevention, technology and education are topics addressed in five types of disabilities. Prosthesis and community are themes addressed in four types of disability. Physical and awareness in three types. Culture, supplies, law, subjects and Brazilian Sign Language in two types. Finally, there are eight themes considering only disabilities in general, as described above, and the Braille theme addressed only for visual impairment.

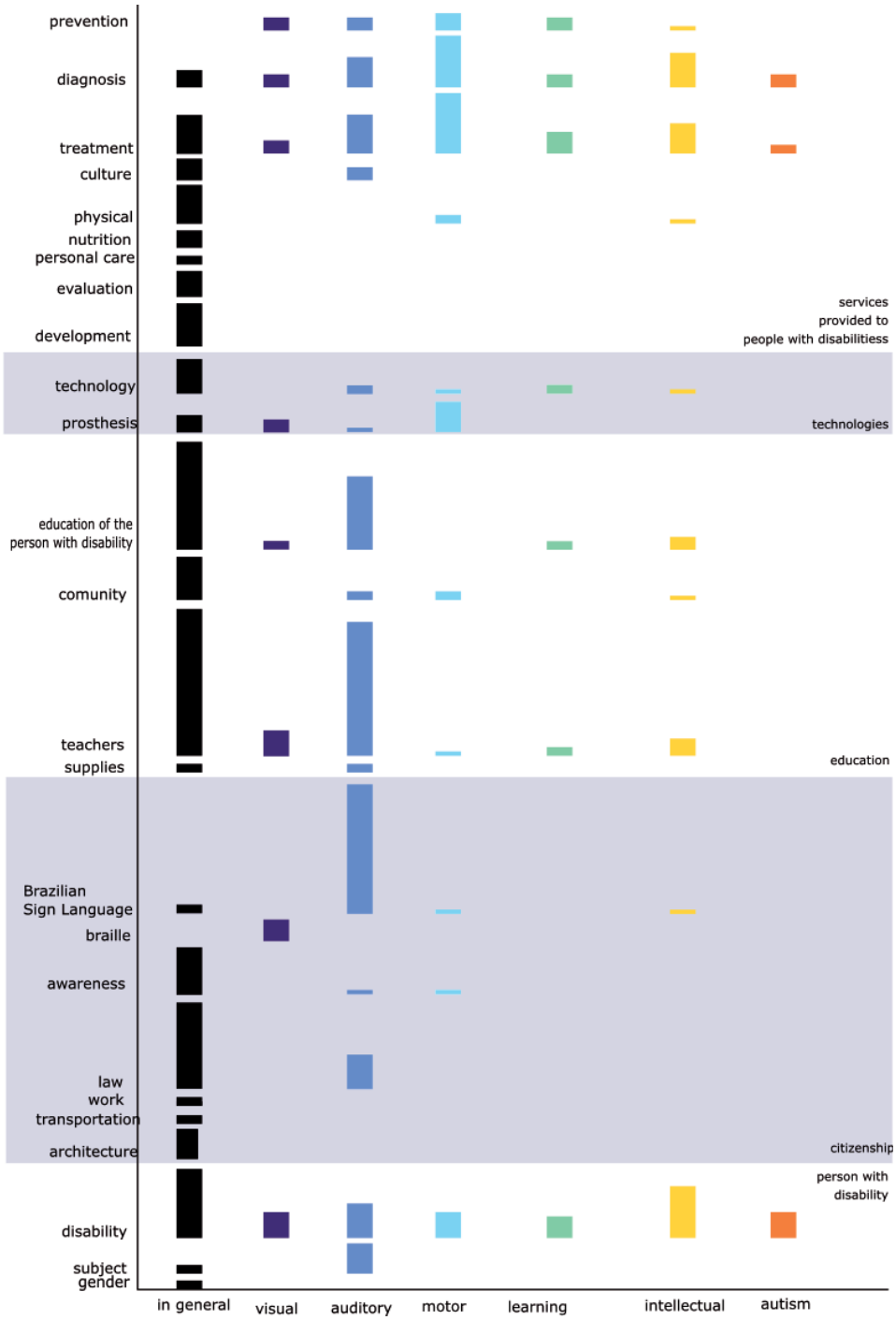

Figure 4. Number of disciplines by disability and theme in all undergraduate disciplines at UFRN.

4 Discussions

This overview of how the university addresses disability in its undergraduate disciplines allows us to identify various aspects of its contribution to the formation of an inclusive society. When it comes to inclusion in Higher Education, the focus usually involves access, retention and course completion for students with special educational needs at the university. UFRN makes a number of efforts in this regard, mainly encouraged and guided by the *Comissão Permanente de Apoio a Estudantes com Necessidades Educacionais* (CAENE) - Permanent Support Committee for Students with Special Educational Needs, created in 2010. However, the results of this research show that the university has already superseded and brought to its undergraduate courses considerations on the theme.

By law or regulation, undergraduate courses are expected to address disability in certain cases. For example, Federal Decree no. 5.626, of December 22, 2005, provides that there is a compulsory Brazilian Sign Language discipline in the teaching degree, Pedagogy and Speech Therapy undergraduate courses, and an optional Brazilian Sign Language discipline for the other courses. Another example of obligation in this regard comes from professional councils, such as the Council of Architecture and Urbanism of Brazil, which impose rules for the construction of environments with physical accessibility. The obligations to address disability are specific. Thus, few courses were expected to address this theme beyond the Brazilian Sign Language disciplines.

However, the reality of UFRN was different from an initial expectation. On the one hand, there are 54 courses (52.4%) that took the Brazilian Sign Language discipline as the first and only step in addressing disability issues. On the other hand, there are 49 courses (47.6%) that took the Brazilian Sign Language discipline only as a gateway to these issues and also addressed other disabilities besides hearing. Of these, 25 courses (24.3%) are the teaching degree and Pedagogy undergraduate courses; and 24 courses (23.3%) from other areas. This course coverage is very interesting as it represents an important victory in removing attitudinal barriers within the university when identifying curricula defined in collegiate courses with initiatives beyond the required ones. What factors would have influenced the definition of these curricula? Would the norms of professional councils and the Ministry of Education explain all planned disciplines? What could stimulate the broadening of the disability approach in Higher Education curricula? These factors need to be studied further to guide improvements in Higher Education.

In the 268 times that disciplines that address disability were included in UFRN undergraduate curricula, the disciplines were considered optional in 60% of them and considered compulsory in the other 40% of the time. In 57.3% of undergraduate courses, there are only optional disciplines. This reflects a mentality that these issues are not yet fundamental in the vocational training of undergraduate students, even living in a country with almost 24% of the population with a disability (Census, 2010). If a professional is going to provide services to ten people in Brazil, he/she should face on average two or three people with disabilities. Would it be optional to serve these people properly? How much is lost economically by not providing services to these people?

The coverage of disability types varies greatly between courses. Hearing impairment is the only one addressed in 100% of the courses through at least one Brazilian Sign Language discipline. Next, disabilities are generally addressed in 45.6% of the courses. Other disabilities appear in less than 7% of the courses. Interestingly, visual impairment ranked last with only 3.9% of courses, despite being the most common type of disability in Brazil (Census, 2010) and one of the first types of disability to receive explicit legal protection. There is plenty of room to broaden the diversity of disabilities addressed within the courses and narrow the gap in the coverage of disability types among them. Therefore, visual impairment deserves special attention from the courses urgently.

Types of disabilities not explicitly addressed in curricula may have been considered during the study of disabilities in general. What would the advantages and disadvantages of a detailed description of types of disability in the curriculum compared to an "in general" abstract description be?

The inclusion policies of people with disabilities in regular education have been important stimuli for universities to pay more attention to this public. Thus, it was expected that the main themes addressed in the disciplines were related to education. Teacher education was indeed a topic addressed in most university courses through the Brazilian Sign Language disciplines. These disciplines were created and offered by undergraduate and pedagogical courses for all university courses. Is this teacher education bias appropriate for non-education courses? Would some particularity (syllabus, methodology, etc.) be required in the execution of Brazilian Sign Language disciplines for courses in different areas? If the differences are relevant, how the offer of Brazilian Sign Language disciplines considering the particularities of the courses be managed?

It is interesting to note that the university was not limited to the education of people with disabilities. It has already begun to address a variety of topics that accompany the complexity of the human being in various fields of knowledge and professions. In addition to education, the themes also included the provision of services to people with disabilities, citizenship and the person with disability him/herself. This effort needs to continue and be expanded.

The categories of analysis and data visualization used in this research are important tools for defining panoramas on how the disability theme is being addressed in undergraduate curricula at the university. Examples of such panoramas are illustrated in Figure 2 and Figure 3. They serve as support for academic (self)assessment and management of individual and institution-wide courses as they facilitate the manipulation and analysis of a large amount of curriculum data. In a large Institution of Higher Education such as UFRN, they allow to identify points that need further investigation, strengths, inconsistencies, and opportunities for improvement by comparing course and themes, comparing courses (e.g. bachelor's vs. teaching degree), comparing areas (e.g. health courses, engineering) and comparing campuses (e.g. capital x hinterland). For example, a quick reading of this UFRN overview allows to raise a number of questions, such as: Why don't several engineering courses study technologies for people with disabilities? Why is the sexuality of people with disabilities studied only by undergraduate teaching courses? Why is the work of people with disabilities not studied in courses such as Administration and Social Work? Why does the Public Policy Management

course only address Brazilian Sign Language themes? Why is awareness not addressed in all courses? Shouldn't other courses have some notion of Braille besides Music - Teaching Degree? Why such a big difference between Medicine in the capital and in the hinterlands? The instruments and analysis results presented in this paper offer better conditions for those responsible to take the necessary measures in the curricula of undergraduate courses at UFRN and other Higher Education institutions.

This research had some limitations that should be considered. The study was restricted to the definition of curricula registered in SIGAA, as it is the official system of the university. The registration of information in SIGAA is expected to be in accordance with the pedagogical projects of the courses, but there was no verification about it. Special topic disciplines do not have a registered syllabus, so they were left out of the study even if they addressed subjects of interest. This study did not analyze the evolution of disciplines and curricula over time. The only caution in this regard was to consider as equivalent disciplines with very similar names and syllabus for the same course, as they should fulfill the same pedagogical role in student education. In addition, the disciplines explicitly indicated in the collected data were also considered equivalent. Finally, it is also essential to remind that the registered curriculum always gains particularities when put into practice by the professor in the classroom. Thus, what is written in the curriculum does not guarantee that the professor has addressed all such themes in the classroom, nor does it prevent the professor from addressing other disability-related topics. This study was based only on explicit course planning, but the courses are made by people, alive, diverse and dynamic.

5 Conclusions

This paper presented an overview of how disability was addressed in the curricula of all UFRN face-to-face undergraduate courses between 2008 and 2017. The number and diversity of courses as well as the types of disabilities and themes studied were significant because they were slightly higher than those required by applicable laws and regulations. The modality, the campus offering and the knowledge area of the courses did not prevent or determine that the curriculum addressed the disability theme. For example, it was possible to identify technologists with comparable disciplines with a bachelor's degree in the same area, courses in the hinterlands with more expected disciplines than those in the capital, and technology courses with a greater number and diversity of disciplines than some of the Applied Social Sciences. It is important to highlight that, in general, the courses in the hinterlands had much closer or better planning than the respective courses in the capital.

In a large and complex context, the analysis of the scenario proposed in this paper makes it easier to identify points that need further investigation, strengths, inconsistencies and opportunities for improvement in the institution's curricula. What ways of investigation would be interesting to explore? By stimulating reflections like these, these scenarios are configured as an important tool for academic assessment and management. Future work should continue this study by investigating the offer of disciplines that address disability and comparing it to the curriculum planning presented here. They should complement this broad and comprehensive overview, based on many quantitative data, with more qualitative studies that allow for deeper

understanding of specific issues. It is also needed to investigate how to make this analysis more efficient to perform it often given the dynamic nature of educational institutions.

A promising way would be to include the categories of analysis and information visualizations proposed in this paper in academic management systems, such as SIGAA. These categories of analysis and information visualization can give rise to tools for assessing the contributions of a Higher Education institution to the formation of an inclusive society by training professionals who deal appropriately with people with disabilities. Similar studies may be part of a process of improving and maintaining the quality of undergraduate courses.

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