A VIEW AT THE SOCIAL REPRESENTATIONS OF TEACHERS ABOUT THE CONCEPTS OF DISABILITY AND ASSISTIVE TECHNOLOGIES

REPRESENTAÇÕES SOCIAIS DOCENTES ACERCA DOS CONCEITOS DE DEFICIÊNCIA E TECNOLOGIA ASSISTIVA

REPRESENTACIONES SOCIALES DE LOS DOCENTES SOBRE LOS CONCEPTOS DE DISCAPACIDAD Y TECNOLOGÍA ASSISTENCIAL

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ABSTRACT: Based on Social Representation Theory (SRT), we investigated the types of disabilities declared by IFRS-Caxias do Sul students and the available types of Assistive Technology (AT). This research interviewed eight teachers and analyzed their narratives, as social representations, about Disability and AT. In addition, 36 enrollment forms were analyzed, revealing 16 types of disabilities. As well as 43 types of AT were cataloged at the institution. Then, based on SRT and Content Analysis, it was found that teachers were consensual when attributing the concept of disability to the Medical and non-Post-Social Model. Little mention was made of the use of AT, but teachers were aware of the relationship between them and the disabilities.

KEYWORDS: Theory of social representation. Disability. Assistive technology. Teachers.

RESUMO: Investigou-se, com base na Teoria das Representações Sociais (TRS), os tipos de deficiências declaradas pelos alunos do IFRS *campus* Caxias do Sul e os tipos de Tecnologia Assistiva (TA) disponibilizadas pela instituição. Esta pesquisa entrevistou oito professores e analisou suas narrativas, enquanto representações sociais, sobre Deficiência e TA. Além disso, 36 fichas de matrícula foram analisadas, revelando 16 tipos de deficiências, assim como 43 tipos de TA foram catalogadas na instituição. Então, a partir da TRS e da Análise de Conteúdo, constatou-se que os professores foram consensuais ao atribuir ao conceito de deficiência relação ao Modelo Médico e não ao Pós-Social. Pouca menção à utilização das TA foi constatada, porém os professores conheciam a relação dessas com as deficiências.

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PALAVRAS-CHAVE: Teoria das representações sociais. Deficiência. Tecnologia assistiva. Professores.

RESUMEN*: Se investigó, con base en la Teoría de las Representaciones Sociales (TRS), los tipos de deficiencias declaradas por los estudiantes IFRS en el campus de Caxias do Sul y los tipos de Tecnología Asistiva (AT) disponibles por la institución. Esta investigación entrevistó a ocho docentes y analizó sus narrativas, como representaciones sociales, sobre Discapacidad y TA. Además, se analizaron 36 formularios de inscripción, revelando 16 tipos de discapacidades. Así, en la institución se catalogaron 43 tipos de TA. Así, a partir de la TRS y Análisis de Contenido, se encontró que los docentes fueron consensuados en atribuir el concepto de discapacidad al Modelo Médico y no al Post-Social. Se hizo poca mención del uso de AT, pero los profesores eran conscientes de la relación entre estos y las deficiencias.*

PALABRAS CLAVE*:* Teoría de las representaciones sociales. Deficiencia. Tecnología de assistência. Maestros.

Introduction

This study investigates which are the main deficiencies declared by the students of the Federal Institute of Science, Education and Technology of Rio Grande do Sul (IFRS) of the Caxias do Sul campus and the types of Assistive Technology (AT) (CAT, 2009) made available by the Center of Assistance to People with Specific Educational Needs (NAPNE) of the IFRS. By adopting the theoretical-epistemological contribution of the Theory of Social Representations (TSR) the objective is to analyze and understand whether the social representations (CAMPOS, 2017; JODELET, 2002) constructed by teachers go to or against what is postulated by the literature on Disability Models (DINIZ; BARBOSA; SANTOS, 2009; MARTÍN; CASTILLO, 2010; FERREIRA, 2011; BISOL; PEGORINI; VALENTINI, 2017) and conceptions about AT aimed at People with Disabilities (PwDs) (BRAZIL, 2000; 2015).

The theoretical framework presents a brief synthesis of Disability Models, covering the Charitable Model, the Medical Model, the Social Model, up to the current Post-Social Model (MARTÍN; CASTILLO, 2010; FERREIRA, 2011; DINIZ; BARBOSA; SANTOS, 2009; BISOL; PEGORINI; VALENTINI, 2017). Afterwards, the concept of Assistive Technology (AT) and the way in which they are classified are discussed, in order to assist and promote the autonomy and integral development of PwDs, with a view to their insertion in a society with more social, political equity, cultural and educational (BERSCH, 2017;

WARSCHAUER, 2006). In this study, it is assumed, from the Vygotskian perspective (VIGOTSKI, 1991), that AT, when consistently used, can help in mediation processes, for the purpose of learning or consolidating a certain pre-existing knowledge, enhancing human development. Although we do not go into the theme, this is the epistemic position taken by the authors of this article.

Then, the IFRS is characterized in terms of its Institutional Pedagogical Project (IPP) aimed at serving students with Specific Educational Needs (SEN) and, finally, it seeks to present the IFRS Caxias do Sul campus as a research locus. This is a qualitative and exploratory research (SAMPIERI; COLLADO; LUCIO, 2013), in which, in a first step, the registration forms of 36 students with different disabilities were analyzed, during the period from 2015 to 2019, within the scope of courses in Basic Education (technical level) and Higher Education (undergraduate level). Data were collected from NAPNE and the IFRS School Records Coordination on Caxias do Sul campus. As for AT resources made available by the institution, these were cataloged from guided tours.

In a second step, 08 teachers from the IFRS campus Caxias do Sul, who work in the teaching of students with SEN, were interviewed, through a semi-structured questionnaire, with the objective of collecting, analyzing and understanding in the teaching narratives, as social representations about concepts such as Disability and AT, when their pedagogical practices. The teachers' narratives were analyzed based on the SRT and the Content Analysis technique (BARDIN, 2011), which allowed, as can be seen in this article, the presentation of discursive fragments in the analysis section that evidence the conceptions about the theme. under study.

Disability models

Historically, there have always been people affected by some type of disability, whose causes and consequences, often poorly investigated, led them to social exclusion (DINIZ; BARBOSA; SANTOS 2009; FERREIRA, 2011). In general, the disabled were not encouraged or inserted in society, given the social understanding that they could not act in an active and productive way for the economic, political and cultural development of the society in which they lived. According to Diniz, Barbosa and Santos (2009), the concept of disability states that it “is not limited to the catalog of diseases and injuries of a biomedical expertise of the body, it is a concept that denounces the relationship of inequality imposed by

environments with barriers to a body with impediments" (DINIZ; BARBOSA; SANTOS 2009, p. 65).

The aforementioned premise is undoubtedly contemplated by Disability Models (MARTÍN; CASTILLO, 2010; FERREIRA, 2011) which, socioculturally, in different historical periods, attributed postulations and labels that place the disabled person as sick, or in need of pity of others, who have a disability due to divine punishment, which places society as a problem for PwD inclusion, or who takes disability as a constitutive aspect of the individual and not as a final and limiting condition for their participation in society. It is worth taking into account that, when referring to a community or part of society, the data from the 2010 Census booklet (BRASIL, 2010), prepared by the Brazilian Institute of Geography and Statistics (IBGE), inform that there are 45,606. 048 Brazilians with some type of disability, that is, 23.9% of the population. Also in this survey, it was found that 18.6% of Brazilians have visual impairment, 7% motor impairment, 5.1% hearing impairment and 1.4% intellectual impairment. These percentages make evident the latent demand for national laws and documents that ensure and supervise the rights of PwDs in Brazil.

In order not to lose sight of the emphasis on the agenda, we infer that, based on the literature in the area, four Models of Disability help us to understand what has been mentioned, because they shed light not only on the concept, but also because they focus on the transition from one conception of disability to another on a diachronic *continuum*. In view of what has been said, the Disability Models are briefly presented, namely: the first, entitled (a) Charitable Model (until the 18th century), in which the person was considered different from normality, being incapable, worthy of help and charity (MARTÍN; CASTILLO, 2010; FERREIRA, 2011). The (b) Medical Model (between the post-war period and 1960) is based on modern medicine that treats disability as a pathology and attempts clinical rehabilitation (DINIZ; BARBOSA; SANTOS, 2009), while (c)) Social Model (from 1960 to 1980) turns to political mobilization, in order to claim the rights to inclusion, the integration of PwD in society and the acceptance of differences, in order to understand that the limitations are in society and not exactly in the subject (MARTÍN; CASTILLO, 2010; FERREIRA, 2011). Finally, the fourth is the (d) Post-Social Model (from 1980 onwards), which conceives that the individual with PwD has demands and capacities beyond their disability and is inserted in a society with barriers - this model is still is under construction (DINIZ; BARBOSA; SANTOS, 2009; BISOL; PEGORINI; VALENTINI, 2017). About the Post-Social Model, it can be said that it aims to build new social practices that help with the inclusion of PwDs, and contextualizes that a PwD is not just a body with impairments, but a person with impairments

and who lives in environment with barriers, maintaining the reconceptualization of disability. It should be noted, however, that contemporarily, there is an understanding of disability still imbued, mainly, with the charitable and medical models, however much this may cause strangeness in the face of the scientific advances that have been registered. It is also worth mentioning that this study is based on the Post-Social Model, as a theoretical-epistemological position, fundamental in the construction of our scientific lenses and in line with the *status quo* of the subject investigated here.

As public policies identified and recognized (BRAZIL, 2004; 2015; 2016) the existence of PwDs (BRAZIL, 2000), it was (is) necessary to legislate in their favor, in order to insert them in a not only integrative, but equitable, that is, with a view to meeting the specificities of each disability, aiming to make possible their social insertion, whether in the context of leisure, work or education. Thus, the context of Assistive Technology is presented in the next section.

Assistive Technology

With regard, in particular, to the educational scope, new practices have emerged (BERSCH, 2017), at all educational levels, Basic and Higher Education, so that the inclusion of students with disabilities occurs and is configured, not as a mere compliance with laws and the Institutional Pedagogical Project (IPP), but mainly as a way of raising awareness and changing social representations, on the part of society, regarding those who have a disability. In the scenario of disability(ies) and Inclusion (CARVALHO, 2016), the emergence of the concept of Assistive Technology (AT) has recently been noticed in Brazil, which is called by Bersch (2017), Cook and Hussey (1995) and Technical Assistance Committee (TAC, 2009) as the use of resources and services that help people with disabilities (PwD), in order to promote their autonomy and independence. In Brazil, the concept of AT is defined by the TAC, which deals with AT or Technical Aids. The TAC defined the AT concept in 2006 and updated it again in 2009, stating that:

> [...] encompasses products, resources, methodologies, strategies, practices and services that aim to promote functionality, related to activity and participation, of people with disabilities, disabilities or reduced mobility, aiming at their autonomy, independence, quality of life and inclusion social (TAC, 2009, p. 9).

This concept addressed by the TAC was also registered in Law No. 10,098/2000, which establishes norms and criteria for the promotion of accessibility for PwDs or people

with reduced mobility, and is also taken up by Law 13,146/2015, which deals with the Inclusion of People with disabilities. Disability (Statute of People with Disabilities) (BRAZIL, 2000; 2015). These documents are corroborated by Bersch (2017), who addresses the objective of AT, which is to provide PwD "[...] greater independence, quality of life and social inclusion, through the expansion of their communication, mobility, control of their environment, skills of their learning and work" (BERSCH, 2017, p. 2). The concept of AT is also assumed by Cook and Hussey (1995) and TAC (2009) as a way to reduce the limitations of PwDs.

Thus, it should be noted that the concept of AT, published by TAC in 2009, does not include the presence and use of AT under the scope of digital resources (TAC, 2009), which are massively present in a supposedly hyperconnected society (CASTELLS, 1999). There is, therefore, a gap of eleven years since the publication carried out by the TAC (2009), which makes it unquestionable not to consider the use of AT in digital format, whether mobile devices or software in general. According to Warschauer (2006), the actions of individuals can be facilitated with the use of tools such as AT, which, when used, can change the sequence and structure of the mental functions of its users, which can enhance the processes of teaching and learning.

ATs can be classified into services and resources (BERSCH, 2017). The services help students with SEN in the selection, acquisition or use of AT or even, for example, interpretation performed by Brazilian sign language interpreters (Libras). Resources are equipment, components, products or systems that are used to increase or improve the functional capabilities of students with SEN. Resources are subdivided into: (a) Aids for daily and practical life; (b) Augmentative and Alternative Communication (AAC); (c) Computer Accessibility Features; (d) Environmental Control Systems; (e) Architectural Projects for Accessibility; (f) Orthoses and Prostheses; (g) Postural Adequacy; (h) Mobility Allowances; (i) Aids for the Blind or Low Sight; (j) Aid for people who are deaf or hard of hearing; (l) Adaptations in vehicles; and (m) Sports and leisure (BERSCH, 2017). Resources, other than computer accessibility (software), are named as Assistance resources, as they are configured as AT, which are aimed at promoting accessibility and facilitating daily actions, such as, for example, the magnifying glass, pencil thickener, braille board or braille labeler, for other purposes of helping students with SENs.

Therefore, it is important to consider the specificities of each person with a disability when choosing an AT, as there are different types and degrees of commitment that require attention to the needs of each subject (TAC, 2009; BERSCH, 2017). Thus, from the

Vygotskian perspective, an AT can help mediate (internalization of activities and behaviors, including tools and signs [VIGOTSKI, 1991]) of the relationships of subjects with some type of disability. The use of AT can help in the processes of human development, so that the movement of knowledge of individuals from one development zone to another occurs (VIGOTSKI, 1991). This "moving" from one area to another comprises the development of cognitive abilities through interactions, which may allow for the learning of knowledge or the improvement of existing processes. Previous studies involving individuals with physical disabilities (FERRADA; SANTAROSA, 2009; BISOL *et al.,* 2018), deaf subjects (CORRÊA *et al.,* 2014; CORRÊA; GOMES; RIBEIRO, 2018), blind or visually impaired subjects (SONZA; SANTAROSA, 2003; BARWALDT; SANTAROSA; PASSERINO, 2008), among others (SONZA *et al.,* 2013; SONZA; SALTON; STRAPAZZON, 2015), have highlighted the potential of using AT as mediators of knowledge construction, subjectivities and autonomy.

Social Representations Theory

Regarding the relationship between the Social Representations Theory (SRT) and the area of Education in Brazil, especially focused on Inclusive Education, it is inferred, according to the postulations of Campos (2017, p. 776), that the SRT "has made a significant contribution, particularly in the areas of teaching work and inclusive education. Also according to Campos (2017, p. 776), the SRT has been adopted regarding aspects such as "the focus of public policies on the teacher, his action, his role in the school, his training and the symbolic or cultural aspects that involve him as an agent [...]".

The adoption by the SRT and its theoretical-epistemological design is due to the fact that the concept of Social Representations (SR) is understood as "[...] a form of socially elaborated and shared knowledge, with a practical objective, and that contributes for the construction of a reality common to a social group" (JODELET, 2002, p. 22). In this sense, it is considered that the social representations of teachers, working in an educational context (IFRS campus Caxias do Sul, in the case of this research) focused on disability, inclusion and the use of AT can enable the understanding of knowledge consolidated "by the interrelationships I[teacher]/other[student/disability]/object-world[AT]", which are constructed by the subjects in a dialogic way (classroom interaction), according to Jovchelovitch (2008, p. 21) and Mazzotti (2002).

Social representations, on the other hand, are symbolic elements, socially constructed and manifested by subjects through language (oral, written, signs, among others), through which beliefs, feelings (conscious and unconscious), sociocultural values, in the form of knowledge that is transmitted between individuals in cultural situations. Thus, the subjects inserted in cultural situations are products and producers of a certain reality. According to Jodelet (2001, p. 21), social representations contain in themselves "the appearance of knowledge", which reveals something in relation to the state of a certain reality. Still in this regard, Giust-Desprairies (2005, p. 174) states that:

> Social representations also concern the construction of a collective reality specific to a specific social group, for which it constitutes an instrument to guide the perception of situations and the elaboration of a response. Finally, because they are formed from interactions, representations concern collective behavior, social communications, and constitute a legitimation of common sense.

Mazzotti (2011) infers that the "use of rhetorical techniques as a means to analyze discourses allows a greater degree of control of researchers' inferences" in the case of an analysis protocol based on the SRT. Regarding the role of the Education professional, Vala (2004) infers that teachers not only receive and process informational content (products of the environment), but are also responsible for the elaboration of meanings and that they, in addition, theorize about social reality that are found producers Sousa (2002), in turn, when referring to the adoption of the SRT for the understanding of aspects related to Education and educators, judges it as capable of encompassing micro and macro-social dimensions, which involve the actors involved in the construction of social representations, as common sense (MOSCOVICI, 1978), endowed with the theoretical-practical character of sociocultural experiences. It is inferred that the SRT, given its psychosocial character, can enable the identification of manifested symbolic processes, conscious or unconscious, about the various aspects present in Inclusive Education. Therefore, the TRS can help to understand the social representations constructed by the institution's professors as a group, since this may not be the same as described and prescribed in the legislation and in the intended uses.

In other words, there may be an interpretation and use that is not regulated by the educational system, but rather locally elaborated, under a concept validated by peers within the institutional framework Thus, it is considered relevant to map the social representations of teachers (mental constructions and their symbolic activities) and not take them as total homogenization, within a supposedly unified social system. In this aspect, it is relevant, as a representational object, to analyze how the teachers surveyed in this study understand their

social representations for the concepts of disability and AT in the educational environment in which they are inserted. The next section discusses the educational context in which this research took place.

Federal Institute of Rio Grande do Sul - Caxias do Sul campus

The Federal Institute of Education, Science and Technology of Rio Grande do Sul (IFRS), according to its Institutional Pedagogical Project, is a federal institution of public and free education, being divided into several campuses to promote professional and technological education, with the aim of to stimulate the development of regions, and its premise is: "[...] the integral development of the citizen, equity; economic competitiveness - seen in a humanized way in a globalization process - and the generation of new technologies" (IFRS, 2012).

IFRS as an educational network has 17 campuses, Bento Gonçalves, Canoas, Caxias do Sul, Erechim, Farroupilha, Feliz, Ibirubá, Osório, Porto Alegre, Restinga (Porto Alegre), Rio Grande and Sertão and, in the process of implementation: Alvorada, Rolante, Vacaria, Veranópolis and Viamão. The Rectory is based in Bento Gonçalves. All campuses serve PwDs. The IFRS Caxias do Sul campus offers professional and technological education at different levels and modalities of education (high school, technical, higher and graduate), articulating Basic Education and Technological Education with Higher Education. Therefore, the configuration of Professional Education is structured as follows: Subsequent, Concomitant and Integrated to High School, Higher Education and Graduate Studies. According to the IPP, the objective of training is to design a society based on socially equitable relationships, in which democracy is referred to the concept of citizenship, as this consists of the possibility for all people to have access to education, culture, work, quality of life, etc., in order to promote human transformation towards its full development (IFRS, 2012).

IFRS Caxias do Sul campus is located in Serra Gaúcha, 130 kilometers from the capital, Porto Alegre. The campus has a total of 1466 students, among the teaching modalities offered; 671 integrated high school students, 90 integrated high school students – PROEJA, 87 students in the subsequent high school and 618 higher education students. IFRS Caxias do Sul campus promotes courses such as: a) Technician in Mechanical Manufacturing (integrated), b) Technician in Plastics (integrated and subsequent), c) Technician in Chemistry (integrated), d) Technician in Administration (integrated in the education modality of young people and adults - PROEJA), e) Degree in Production Engineering, f) Metallurgical

Engineering, g) Degree in Mathematics, h) Technology in Management Processes, i) Technology in Metallurgical Processes, j) Post-Graduation in Teaching in Education Basic and Professional and k) Professional Master's in Materials Technology and Engineering. The next section presents the research methodology of the study carried out.

Methodology

This is a qualitative and exploratory research (SAMPIERI; COLLADO; LUCIO, 2013), which is divided into two stages.

In the first stage, it was verified what types of disabilities were found in IFRS Caxias do Sul campus students and what AT resources were available at the institution. The information was collected from the Coordination of School Records and the Center for Assistance to People with Specific Educational Needs (NAPNE). Data were obtained through 36 student registration forms (identifications anonymized by the institution), who are or were enrolled in the campus from 2015 to 2019, which allowed mapping and classifying the: (a) year of entry at IFRS Caxias do Sul campus, (b) types of students' disabilities and (c) educational level.

Regarding AT, these were cataloged from two guided visits to the IFRS-Caxias do Sul campus, while exploring the field of research, in loco, which were monitored by a Specialized Educational Service Technique (SES). After the visit and for the purpose of recording the identified ATs, the aid and software resources were cataloged in a spreadsheet. The survey carried out in the first stage of this research enabled the elaboration of two tables presented in the Data Analysis section.

In the second stage, it was analyzed based on the Social Representations Theory (SRT) (CAMPOS, 2017; JODELET, 2001; 2002; JOVCHELOVITCH, 2008; MOSCOVICI, 1978), in dialogue with the literature on Disability (DINIZ; BARBOSA; SANTOS) , 2009; MARTÍN; CASTILLO, 2010; FERREIRA, 2011; BISOL; PEGORINI; VALENTINI, 2017) and AT (BERSCH, 2017; CAT, 2009; COOK; HUSSEY, 1995), the answers provided by eight IFRS Caxias do Sul campus, when interviewed through an online questionnaire, consisting of 21 semi-structured questions. The questionnaire was divided into: characterization of the subjects, followed by 04 thematic axes: (a) Teacher Training; (b) Teaching Work; (c) TA Resources; and (d) Assistance to students with SENs. This questionnaire contained 02 multiple-choice questions and 19 open questions; after the

questionnaire was returned, the answers were gathered according to the thematic axes so that the analyzes could be carried out.

The teachers interviewed work in Integrated High School, Integrated High School PROEJA, Subsequent Education and Higher Education, teaching classes to students with SENs. The age group of the teachers ranged between 33 and 43 years old, and the group was composed of 04 female professors and 04 male professors. The initial academic training of all was higher education.

The choice involving the interviewees in question was due to "convenience and accessibility to the interviewees" (SAMPIERI; COLLADO; LUCIO, 2013, p. 409), anonymously and mediated by NAPNE. As for the small number of interviewees, considering that it is an analysis of narratives based on SRT and Content Analysis (BARDIN, 2011), which aims to identify social representations of professors from a specific institution, it was considered, according to Cresswell (2013, p. 223), the researchers sought to identify "as many incidents, events or activities as possible to support the categories", and in this search, when they found "that the categories are "saturated", therefore, without give rise to information other than those already identified. For Cresswell (2013, p. 134), "the important point is to describe the meaning of the phenomenon for a small number of individuals who have experienced it". Once discursive fragments were identified in accordance with the narrative of three teachers, the number was considered to be sufficient, however, in an attempt to validate the discursive conformity of the interviewees, it was decided to consider the participation of another five (5) individuals. Sampieri, Collado and Lucio (2013) say that the number of participants in qualitative research is directly associated with the understanding of what is investigated about the phenomenon under analysis, an aspect that tends not to establish an ideal and determined number of participants.

The concept of AT was approached through questions that made it possible to understand the beliefs, values and signs given by the teachers to the objects of social representations. Content Analysis (CA) has been adopted in qualitative research in the areas of Social Sciences, Psychology and Education. According to Bardin (2011, p. 38), the CA is composed of "systematic and objective procedures for describing the content of messages, indicators (quantitative or not)", which allow the extraction of knowledge regarding the context/scenario of production/reception in that individuals emit certain information (verbal or non-verbal). Since the CA itself has three stages, namely (a) pre-analysis, (b) exploration of the material and (c) treatment of the results, we chose, methodologically, to follow the criteria for the purpose of understanding the investigated phenomenon. Thus, based on the CA, a

floating reading (BARDIN, 2011) of the dissertation responses of the semi-structured questionnaires was conducted, in order to understand, identify, extract and present the grouping of narratives and discursive fragments as units of meaning, in this study. in the form of 04 thematic axes. To present the narratives, we chose to name the research subjects with the initial (P), referring to the Participant, and an Arabic number, for example, (P1), in order to preserve the total anonymity of the participants. In the next section, the data analysis of the study is presented.

Data analysis

In this section, the findings of each research stage of this study are presented, in isolation, being: (a) the first, focused on students with disabilities and AT present in the researched institution and, (b) the second, focused on the interview with teachers about students with disabilities, training with AT and use of these for educational purposes; Finally, we will consider the relation between the two stages.

In the first stage, the analysis of the 36 anonymized registration forms of students who entered the IFRS campus Caxias do Sul as PwD(s), during the period from 2015 to 2019. These students were aged between 14 and 35 years old, 29 were male and 7 were female. The tabulation of data from the registration forms made it possible to create Table 1, in which: (a) year of entry; (b) type of disability, (c) number of students and (d) educational level were mapped. Therefore, in Table 1 it is possible to visualize an overview of the deficiencies reported by the students.

Table 1 - Survey of Types of Disabilities

YEAR	DISABILITY	NO. STUDENTS	EDUCATIONAL LEVEL
2015	Attention Deficit Hyperactivity Disorder	5	Technical education
	Low Vision	1	Technical education
	Attention Deficit	1	Technical education
2016	Charcot Marie Tooth Neuropathy (Lower limbs)	1	Technical education
	Low vision	1	Technical education
	Down's syndrome	1	Technical education
	Cerebral Palsy	1	Higher education
2017	Decreased Body Balance	1	Higher education
	Neurological Deficit	1	Higher education
	Deafness	1	E Higher education
	Vocal fold paralysis	1	Higher education
	Low Hearing	3	Technical education
	Attention Deficit Hyperactivity Disorder	2	Technical education
	Fibular Hemimelia – Lower Limbs	1	Technical education
2018	Low vision	1	Technical education

	Low vision	1	Higher education
	Attention Deficit Hyperactivity Disorder	1	Technical education
	Deafness	1	Higher education
	Physical Disability - Upper Limbs	3	Technical education
	Cerebral Palsy	2	Technical education
2019	Attention Deficit Hyperactivity Disorder	1	Technical education
	Deafness	1	Technical education
	Deafness	1	Higher education
	Physical Disability - Upper Limbs	1	Technical education
	Cerebral Palsy	1	Technical education
	Cognitive Deficit	1	Technical education

Source: Prepared by the authors

It should be noted that in none of the 36 registration forms did the students report being PwDs with more than one disability at the same time. Of the total number of records analyzed, 77.7% of the students enrolled in Basic Education in Integrated Technical Courses or subsequent to High School. As for Higher Education, there was a total of 22.3% with enrollment made. Occasionally, in relation to deficiencies, data analysis allowed the identification of 16 different types of deficiencies, which could be categorized, according to Decree No. 5,296 (BRAZIL, 2004), in: *Physical Disability: cerebral palsy; physical disability in the upper limbs; Fibular Hemimelia; Charcot Marie Tooth Neuropathy; vocal fold paralysis; reduced body balance; (b) Hearing Impairment: Deafness; low hearing; (c) Visual Impairment: low vision; (d) Intellectual Disability: Neurological Deficit; Down's syndrome; (e) Other Educational Needs (NE): Pervasive Developmental Disorder (PDD); Attention Deficit Hyperactivity Disorder (ADHD).* It should be noted that NAPNE provides for care under the responsibility of the SES for all students with SEN. During the data analysis, it was also verified that there is a predominance of 27.7% of students with a medical opinion of Attention Deficit Hyperactivity Disorder (ADHD); 30.5% of students with Physical Disabilities; 16.6% of students with Visual Impairment; 13.8% with Hearing Disabilities, 5.5% with Intellectual Disabilities and 30.5% with other ENs.

After mapping the types of disability(ies), an investigation was carried out on the type of AT made available by the IFRS campus Caxias do Sul for the academic community[5], when conducting two guided tours of the institution's premises, together with a NAPNE employee. In view of the cataloging in a Microsoft Excel spreadsheet, for the purposes of registration and subsequent grouping, below, in Table 2, a list is presented consisting of 41 AT resources

[5] The term academic community was chosen in view of the fact that both teachers and students (end users) and civil servants in general can participate in the processes of development, adaptation and use of AT that can mediate the implementation of activities carried out in the educational context.

made available by the IFRS Caxias do Sul campus, and these were classified into two categories , (a) 15 assist TA resources and (b) 26 software TA resources.

Table 2 – Mapping of Assistive Technology available at IFRS - Caxias do Sul

TYPES OF RESOURCES	DESCRIPTION
ASSISTANCE	**1. Reading Resources -** Magnifying Glass, Digital File Reader, Keyboard for the Visually Impaired (beehive), Autonomous Reader with Integrated Voice Digitizer**; Writing Resources -** Pencil Thickener, Reglete; Plate and Puncture, Braille Labeler; **2. Mobility -** Crutches, Canes; **3. Teaching Materials -** Multiplan, Geoplan, Soroban, Laptop computer, Chess for the Visually Impaired; Braille alphabet.
SOFTWARE	**1. Screen Readers** – *NVDA; Orca; VoiceOver; TalkBack, DosVox;* **2. Screen Magnifier** – Magnifying glass from *Windows*; LentePro; *Virtual Magnifying Glass; Lightning 3; Magnifixer; Zoomlt;* **3. Color Change** - *High Contrast; Dark Reader; Dar; Background and Light Text; Blank Your Monitor + Easy Reading;* **4. Augmentative and Alternative Communication (AAC)** - AraBoard; Easy board; Plaphoons; Scala; **5. Computer mouse alternatives –** *Mousem Camera* and *Viacam*; *HeadDev; Headmouse;* **6. Keyboard alternatives for computers –** Virtual keyboard form Windows; *MouseKey*.

Source: Prepared by the authors

The offer of software resources and AT assistance was understood as in line with Art. 2, Law No. 13.146, of July 6, 2015, which provides that AT can be used, in educational contexts, of Basic Education or Higher, as pedagogical resources, that is, capable of mediating the teaching and learning processes for PwDs, when properly used according to the student's disability. Such use of an AT, as mentioned, can enable the person's autonomy and independence, as well as for the purpose of learning or consolidating the student's pre-existing knowledge (BRAZIL, 2015). During visits to the institution, it was found that the aid resources are mostly aimed at blind and low vision students (Magnifying glass, NVDA, DosVox), as well as students with physical disabilities (Pencil Thickener , MouseKey, Headmouse). However, this finding is in line with the main SENs shown in Table 1, since a higher incidence of students with Attention Deficit Hyperactivity Disorder (ADHD) was inferred.

Regarding software resources, it was found that these are coherently available, according to the demand for types of students' disabilities. Since these are computational resources, these are installed on the computers that students use. The institution makes use of free software, which allows many to be offered, so that the student can use the one that best fits, according to their SENs. Also with regard to AT, the prevalence of AT software (63.4%) was found in relation to AT assistance (36.6%), which allowed us to deduce that AT software,

as they are free, friendly and easy to acquire, end up becoming more present on campus, even because they are available in the current information society (CASTELLS, 1999), of which students are a constitutive part. The software AT mainly covers students who are blind or have low vision and students with disabilities in the upper limbs.

With regard to the second stage of research, initially, we present here the characterization of the 08 professors of the IFRS campus Caxias do Sul, as research subjects, who answered the semi-structured questionnaire, in order to verify symbolic social representations about the concepts of Disability and AT, as well as the teaching practice with students with SEN. The initial academic training of the 08 professors was in Higher Education and all of them had postgraduate degrees, and (05) five of them have a doctorate, mainly focused on the field of Engineering. All teachers reported making daily use of the internet, using a laptop or smartphone. Only 1 teacher reported using a desktop computer.

After the characterization of the professors and a brief survey on internet access and use of computer resources were carried out, the analysis of the professors' narratives was carried out with the support of the Content Analysis technique (BARDIN, 2011), following the steps provided in the literature and mentioned above. methodology section. Based on the CA and following the themes of the questionnaire applied, (04) axes were defined, which were named as (a) Teacher Training – related to the initial and continuing training of teachers in the area of Inclusive Education; (b) Teaching Work, analysis of notes made by teachers about their work in relation to students with disabilities and SN; (c) AT Resources – addresses the use of resources, strategies or equipment used by teachers in the classroom; and (d) Assistance – statements about the monitoring of students with disabilities and SN (Special Need) at the institution. Next, each axis and examples of discursive fragments obtained through a questionnaire are presented, which aim to illustrate the social representations of the group of professors:

(a) Teacher Training – only 2 teachers reported having taken courses in the area of Inclusive Education focused on the use of AT. Of the 8 interviewees, 1 reported having carried out training, at an extension level, promoted by the institution; 1 reported having taken a course in the area, but with their own investment, and the other 6 professors reported never having participated in courses in the area in question. Therefore, there was a lack of teacher training, an aspect that does not live up to the Inclusion Law, Law no. 13,146 (BRAZIL, 2015), which provides for teacher training in accordance with article 28: “X - adoption of inclusive pedagogical practices by initial and continuing teacher training programs and the provision of continuing training for specialized educational services” (BRAZIL, 2015, s/p).

Thus, it can be said that there is a gap between theory and practice, given that there is a lack of teacher training regarding educational work with students with disabilities. (b) Teaching Work (Table 03) - the analysis of teachers' narratives about their work in relation to students with disabilities shows that there is an understanding of the concept of disability, as predicted by (BRAZIL, 2000; 2015; TAC, 2009) and types of disability, as a construct of symbolic social representations (BRAZIL, 2004), considering that most of these have never been trained in this area of knowledge.

Table 3 – Fragments of teachers' narratives

TEACHING WORK	
PARTICIPANT	**NARRATIVE**
P1	"Absence of (or abnormality in) any function of the body or mind for a long time." "Physical, sensory and intellectual. The difficulty in working in the classroom also depends on factors external to the student's own disability, but, in general, in the area in which I work, visual and intellectual disabilities are the ones I have the most difficulty managing."
P3	"A physical or cognitive characteristic that causes a person to present one or more difficulties in performing certain practical or theoretical activities when compared to a pre-established pattern." "I believe I know a few: hearing impairment, visual impairment, intellectual disability, ADHD, physical disability. I think there is greater difficulty in cases of visual impairment and intellectual disability."
P8	"A specific condition that may or may not restrict access to some people. And these restrictions are due to the way the world and society are organized, privileging people "without disabilities". "Cerebral palsy, Down´s syndrome, blindness and deafness."

Source: Prepared by the authors

The narratives, even as symbolic social representations for what little or nothing was obtained through scientific training, reveal a perspective of the concept of disability based on the perspective of the Medical Model (DINIZ; BARBOSA; SANTOS, 2009), focusing on a body with impediments, and not due to a bias of the Post-Social Model (DINIZ; BARBOSA; SANTOS, 2009; BISOL; PEGORINI; VALENTINI, 2017). This deals with the inclusion of people with disabilities, mainly related to school inclusion, ensuring pedagogical assistance, specific resources and inclusion, in order to manage the necessary care for students with disabilities to have access to education.

Still from the perspective of disability as an impediment and difficulty factor, teachers emphasize their problems in working with students with certain types of disabilities and SENs, an aspect that corroborates a symbolic representation of the concept of disability consolidated in the Medical Model (DINIZ, 2009), in that disability by itself is taken as restrictive, without taking into account the contextual aspects of the educational scenario as a whole. In addition, teachers listed a range of types of disabilities and SENs (physical, visual,

sensory, deafness, low vision, cerebral palsy, ADHD, mobility impairment, autism, reduced mobility, Down´s syndrome and cognitive impairment), the which points out that despite the gap in scientific training in the field of Disability, professional practice leads them to the construction of co-constructed knowledge at the heart of doing and being a teacher. This knowledge that emerges from social and professional practice, however, allows us to infer that teachers have knowledge about the deficiencies of students in the institution (Table 1). In an attempt to circumvent the lack of professional and teaching training, (06) six teachers reported that they carry out research on the internet about disabilities, resources and teaching and learning methodologies to assist in the development of content and to understand the educational need of the student. All professors[6] received from the Institution a notebook for work purposes with resources for the disciplines. When questioned, 06 teachers reported that they use the devices to research and organize materials for students with disabilities and ENs. Of the (08) eight teachers interviewed, (07) seven reported having knowledge about the NAPNE and only (01) one said he was not close to the center.

(c) AT resources (Table 4) – regarding the use of AT resources, strategies or equipment used by teachers, the analysis of the narratives made it possible to identify what teachers understand about the AT concept: they approach it as an assistance resource (DINIZ ; BARBOSA; SANTOS, 2009; MARTÍN; CASTILLO, 2010), as can be seen in the discursive fragments below.

Table 4 – Fragments of professors' narratives

AT RESOURCES	
PARTICIPANT	**NARRATTIVE**
P4	I understand how those means (videos, subtitles, games...) that provide special attention to the student facilitating their learning... and better didactic conditions for the teacher to work with the student who has special needs.”
P5	They are resources (of the most varied types, both mechanical, concrete, playful and digital materials) that help students with SEN to have greater autonomy, allowing a greater degree of interaction with the teacher, with the discipline and often with the class itself.
P8	“These are resources (technological or NOT) that can be used to give equal access to people who have some kind of restriction due to some physical (or mental) condition.”

Source: Prepared by the authors

According to the adopted reference, the professors appropriate a symbolic construction, therefore, social representations of the AT concept in a way that is different from what is foreseen in the literature in the area, that is, different from what the official documents define (BRAZIL, 2000; 2015), TAC (2009), Cook and Hussey (1995) and Bersch (2017), regarding the understanding that ATs aim to promote autonomy, independence,

[6] In this case, the professors from the institution's staff were considered.

quality of life and inclusion of people with disabilities. There is a belief attributed by the professors as a support and not for the true bias and purpose of using AT in the educational field. In this horizon, it is possible to affirm that the professors remained, linearly, in the shadow of the Medical Model (DINIZ, 2009), as observed with the concept of disability, since 6 professors approach AT as an instrument of assistance. Only participant P5 alluded to the concept of AT in a more elaborate way, considering the bibliography cited in this study. None of the analyzed responses considered AT as a mediation instrument for learning, according to the Vygotskian view (VIGOTSKI, 1991), but rather with a view to assisting/assisting students with disabilities. It is important to point out that only (02) two teachers said they use AT in their classes. However, three participants reported using AT resources; when questioned, they reported: adapted mouse; virtual keyboard; font size increase; tablet with specific programs; cards with words and images; projector; software (unspecified); pound interpreter; voice recorder, methodologies adapted to each disability. The analysis of the narratives showed that the professors have a moderate knowledge about the AT concept, showing that half of the professors associate AT with the term of assistance or attendance. It is likely that the representation of the concept is still being constructed by teachers, exactly as a social construct, locally constituted by social representations, but which, in the research context of this study, must be elaborated based on the SRT.

(d) Assistance to students with SENs (Chart 5) – concerning the narratives about the assistance to students with disabilities and SN in the institution, the professors reported requesting to carry out the SES or requesting the follow-up of a SES technician. Of the (08) eight teachers, (04) four reported that they provide assistance or requested help from the SES technician, the other (04) four responded that they did not or that there was no need or opportunity to provide assistance to students with disabilities.

Table 5 – Fragments of professors' narratives

SERVICE TO STUDENTS WITH SENs	
PARTICIPANT	**NARRATTIVE**
P3	"So far I haven't needed it, but I think that depending on the disability it is essential that the student is accompanied by a specific professional during classes."
P4	"Yes, because it is through the SES Technician that I can better understand the student's challenges and from there provide better teaching conditions."
P7	"I have been assisting students, but in some cases it has been extremely difficult to move the class forward and make progress with the student."

Source: Prepared by the authors

With the approach of the narratives presented, it is clear that the professors understand the importance of SES even with difficulties, as reported by participant P7. According to

IFRS (2012) and Law No. 13,146 (BRAZIL, 2015), the institution has promoted SES through SES technicians and also by teachers, even if they have difficulties and/or have not yet had the opportunity to work with students. with disabilities or SNs.

Final considerations

This study mapped the types of disabilities of IFRS students at Caxias do Sul campus and the types of AT (aid and software) provided by the institution, as well as interviewing professors, in order to analyze, through their narratives, social representations about the concepts of disability and use of AT in their practices with students with disabilities and SN. The predominance of SN of the ADHD type and physical disability was identified, and a greater amount of AT aimed at students with low vision, an aspect that proved to be deficient, given that there is a more expressive demand for AT for students with ADHD and physical disabilities . As for students with declared disabilities, a higher number was found at the Technical High School level (28 students) than at the Higher Education level (08 students), an aspect that highlights the difficulty of access to Higher Education for PwDs, in this case , students who need SES. Another aspect that emerged from this research was the greater expressiveness of the supply of AT software, which is justified due to the current information society in which we are inserted. An important aspect about the offer of AT software made available by IFRS is that, as they are generally free, they can be used by students with SENs in other spaces, beyond the educational environment. This allows students to familiarize themselves with technological resources even beyond their school activities, discovering other functions for AT.

Regarding the interviews, there was a lack of teacher training focused on the area of Inclusive Education, on disabilities and AT as a gap between theory and practice, because all the literature and legislation provide for the training of education professionals to the conduction of good practices in the teaching and learning processes of students with disabilities, whether in the classroom or in the SEN. The narratives revealed not only the lack of training, but the consequences of this, since most teachers reported difficulties in working with students with disabilities, either because they did not understand their educational needs or the type of AT to be adopted in a coherent way. It was found that the teachers presented symbolic social representations for the concept of disability from the perspective of the Medical Model, excluding the context of the Post-Social Model, sometimes having little knowledge of this perspective of the Post-Social Model. Perhaps this is an aspect to consider

in the continuing education of teachers. Finally, it was evident that teachers are aware of AT resources and students' disabilities, but do not know how to use them to promote the autonomy and independence of students with disabilities or SEN in the school environment, without realizing them as mediating instruments for the construction of knowledge.

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