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**ARTICLE**

# REMOTE TEACHING FOR STUDENTS WITH SPECIAL EDUCATIONAL NEEDS AT FEDERAL INSTITUTES

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**ABSTRACT:** Due to the Covid-19 pandemic and the required social distance measures, face-to-face classes were suspended in early 2020. Considering this scenario, the purpose of this study was to analyze the practices of educational planning for students with Special Education Needs (SEN) at the Federal Institutes of Education, Science, and Technology (*Institutos Federais de Educação, Ciência e Tecnologia* - IFs). The exploratory and descriptive approach used in this study, which is in the format of survey research, was carried out with the participation of 156 professors from different campuses of the FIs. Data collection was performed via a questionnaire. The data obtained were systematized, organized, and analyzed both quantitatively and qualitatively into thematic categories, following the instrument variables. The results showed that teachers sought different alternatives in remote education, such as: collaborative planning; adoption of different procedures in specific planning; prediction of changes in pedagogical practices; use of didactic material and adapted assessments, etc. The adopted technologies and the virtual environment were considered in both positive and challenging aspects. It is concluded that the demand to meet the educational needs of these students in remote education requires the redesign of pedagogical processes, with different actions, which will vary depending on each institute. However, there was a lack of guidelines to develop the individualized teaching plan, as well as greater articulation collaboration with special education teachers, which can impact the quality of teaching and learning of students with SEN. It is suggested that further research should be carried out, seeking to further deepen and evaluate the remote teaching experiences during the pandemic.

**Keywords**: school inclusion, covid-19, educational planning, curriculum accessibility, professional education.

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## ENSINO REMOTO PARA ESTUDANTES DO PÚBLICO-ALVO DA EDUCAÇÃO ESPECIAL NOS INSTITUTOS FEDERAIS

**RESUMO:** Em decorrência da pandemia da Covid-19 e das medidas de distanciamento social requeridas, as aulas presenciais foram suspensas no início de 2020. Diante desse novo contexto, o objetivo do estudo consistiu em analisar como ficou o ensino para os estudantes público-alvo da educação especial (PAEE) nos Institutos Federais de Educação, Ciência e Tecnologia (IFs). A abordagem exploratória e descritiva, do tipo pesquisa de levantamento, foi realizada junto a 156 docentes de diferentes *campi* dos IFs. A coleta de dados foi realizada por meio de questionário. Os dados obtidos foram sistematizados, organizados e analisados quantitativa e qualitativamente em categorias temáticas, acompanhando as variáveis do instrumento. Os resultados evidenciaram que os docentes buscaram diferentes alternativas no ensino remoto, tais como: planejar colaborativamente; adotar procedimentos diferenciados no planejamento específico; prever modificações na prática pedagógica; utilizar material didático e avaliações adaptadas etc. As tecnologias e o ambiente virtual foram considerados tanto em aspectos positivos quanto desafiadores. Conclui-se que a demanda para atender às necessidades educacionais dos estudantes PAEE no ensino remoto exigiu o replanejamento dos processos pedagógicos com diferentes ações que variaram a depender de cada instituto. Contudo, faltaram diretrizes para elaborar o plano de ensino individualizado, assim como maior articulação com os professores de educação especial, o que pode impactar a qualidade do ensino e a aprendizagem do PAEE. Sugere-se que outras pesquisas sejam desenvolvidas, buscando maior aprofundamento e a avaliação das experiências docentes durante o ensino remoto no contexto da pandemia.

**Palavras-chave:** inclusão escolar, covid-19, planejamento educacional, acessibilidade curricular, educação profissional.

## ENSEÑANZA REMOTA PARA ESTUDIANTES CON NECESIDADES EDUCATIVAS ESPECIALES DE INSTITUTOS FEDERALES

**RESUMEN:** Debido a la pandemia del Covid-19 y las medidas de distancia social requeridas, las clases presenciales fueron suspendidas a principios de 2020. Dado este nuevo contexto, el objetivo del estudio fue analizar el proceso de enseñanza para estudiantes con necesidades educativas especiales (NEE) en los Institutos Federales de Educación, Ciencia y Tecnología (IFs). El enfoque exploratorio y descriptivo, del tipo de investigación por encuesta, se realizó con 156 profesores de diferentes campus de los IFs. La recolección de datos se realizó mediante un cuestionario. Los datos obtenidos fueron sistematizados, organizados y analizados cuantitativa y cualitativamente en categorías temáticas, siguiendo las variables del instrumento. Los resultados mostraron que los docentes buscaron diferentes alternativas para la enseñanza remota, como la planeación colaborativa; adoptar diferentes procedimientos en la planeación específica; predecir cambios en la práctica pedagógica; utilizar materiales didácticos y evaluaciones adaptadas, etc. Las tecnologías y el entorno virtual se consideraron tanto en aspectos positivos como desafiantes. Se concluye que la demanda para atender las necesidades educativas de estos estudiantes en la enseñanza remota requirió el rediseño de los procesos pedagógicos, con diferentes acciones, que variaron dependiendo de cada instituto. Sin embargo, faltaron lineamientos para desarrollar el plan de enseñanza individualizado, así como una mayor articulación con los maestros de educación especial, lo que puede impactar la calidad de la enseñanza y el aprendizaje de estudiantes con NEE. Se sugiere que se desarrollen más investigaciones, buscando profundizar y evaluar las experiencias de los profesores durante la enseñanza a distancia en el contexto de la pandemia.

**Palabras clave:** inclusión escolar, covid-19, planeación educativa, accesibilidad curricular, educación profesional.

## INTRODUCTION

With the spread of the Covid-19 pandemic and the preventive measures required by it such as social distancing, the educational institutions around the world needed to seek emergency alternatives to enable the maintenance of education for students of all ages and stages of education. In many contexts, the proposal of non-face-to-face educational activities was organized, such as remote teaching, using different strategies and learning formats, highlighting the alternative of the virtual environment. Along with the requirement of physical distancing and new ways of offering education, we should reflect on the educational planning process in this scenario so that the individual needs of students are met and the inclusive education system is supported.

Planning is a present and necessary activity in human society as it provides elements that allow us to examine a given context, reflect and organize ways to solve problems or achieve certain objectives in an established situation. In the school environment, educational planning is considered a process resulting from the teaching practice, encompassing different actions and events present in the relationships between educators and students (FUSARI, 1989). According to Haydt (2011), in the area of education, there are types of planning with different amplitudes and complexities such as the teaching planning considered "the specification and operationalization of the curricular plan" (p.72), in which educators establish the educational objectives to be achieved by students, intend actions and procedures to be used and student activities. From this process, the teaching plan is elaborated, which is an extremely relevant instrument for the development of teaching and learning.

For Arruda (2015), planning collaborates with pedagogical praxis, as it is a guide in interventions during the teaching and learning process, in which the act of planning is one of the stages of organizing teaching activities. Correia et al. (2018) point out that planning helps teachers to prepare a practice that prioritizes the construction of knowledge and the transformation of the social environment. Considering that the teaching planning process is directly related to the educational possibilities that students will receive, it is important to think about the accessibility of planning for classrooms with students with Special Education Needs (SEN) enrollment, which includes students with disability, pervasive developmental disorders and high abilities/giftedness (BRASIL, 2011).

Studies such as Ferreira and Carneiro (2016) illustrate that in the pedagogical performance of teachers aimed at these students, there are contexts of improvisation, lack of accessible teaching planning and non-adapted activities, even when they are necessary. As one of the determinants of this context, it is evident the absence of the special education teacher to work collaboratively with the common room teacher[5], lack of training of regular education teachers to promote accessibility, and, in addition, lack of working conditions to apply collaborative practices. Thus, collaboration is considered a key element for facing problems related to the teaching and learning process of SEN students. Preparing plans and proposing alternatives in which everyone acts with the same level of responsibility and engagement, considering the individualities and needs of each student, are practices that can be intensified with collaborative initiatives in the construction of educational planning in the school collective.

Some particularities related to planning for students with SEN, according to Mendes, Vilaronga, and Zerbato (2014), indicate that the process should be the responsibility of the common room and special education teachers, preferably in collaboration, involving the planning of objectives, strategies, activities, and evaluation of the teaching process that may favor access to the common curriculum. In this sense, the planning for the students with SEN indicates the need to guarantee working conditions for moments together and during the same shift, so that the partnership between regular and special education teachers favors the possibility of planning together with the teaching process for these students (ZERBATO; VILARONGA; SANTOS, 2021).

[5] A common room is the classrooms of the different years of school carried out in regular education. While special education is characterized as a teaching modality that permeates all levels, stages and other modalities, providing specialized educational service (BRASIL, 2008b).

The topic of planning for the SEN has been studied and discussed within the scope of the Federal Network of Professional, Scientific and Technological Education (Federal Network), considering its breadth and relevance in the different contexts of the regions of Brazil; the diversity in the offer of courses and the quality of teaching and the diversification in vocational and technological education. With Law 11,892 (BRASIL, 2008a), the Federal Network has the following institutions in its composition: *Institutos Federais de Educação, Ciência e Tecnologia* (IFs); *Universidade Tecnológica Federal do Paraná* - UTFPR; *Centros Federais de Educação Tecnológica Celso Suckow da Fonseca* of Rio de Janeiro (Cefet-RJ) and of Minas Gerais (Cefet-MG); Linked Technical Schools to *Universidades Federais* and; *Colégio Pedro II*.

With 38 IFs organized and distributed throughout Brazil in a variety of campuses, this amplitude is considered favorable for discussion and reflection on the education of the SEN in the professionalizing context, aiming at the possibility of equal opportunities for access and school permanence, and to conditions for more effective participation in society, as this space envisions entry into the labor market.

In the context of the IFs, the Assistance Centers for People with Specific Needs (ACPSNs) were created through one of the actions of the Education, Technology and Professionalization Program for People with Specific Educational Needs (TEC NEP- *Programa Educação, Tecnologia e Profissionalização para Pessoas com Necessidades Educacionais Específicas*) for the development of actions related to the process of school inclusion (NASCIMENTO; FARIA, 2013; SANTOS, 2020). We should highlight that the target audience of ACPSN service includes, in the definition of students with specific educational needs, all those who have "limiting learning conditions or barriers in their school trajectory of a permanent or temporary nature" (BRASIL, 2018, p. 13), whose extension goes beyond the SEN. In addition to the diversification of the people assisted, the diversified role to the nucleus in the network, attributing different meanings to the nomenclature referred to ACPSN in the context of the Federal Network, Understood by some, as a support nucleus and, by others, as a service nucleus (SANTOS, 2020).

Regarding the composition of the nucleus, there is also no linearity, because, despite the existence of guidelines for the composition of the Nuclei in the TECNEP Program, there was no funding or hiring of professionals to work in this space, leaving each institution to claim the destination of the vacancy codes of these professionals (SANTOS, 2020). In a document prepared collectively by professionals from the Technological Professional Network, but without official publication by the Secretary of Professional and Technological Education (SETEC- *Secretaria de Educação Profissional e Tecnológica*), a multidisciplinary team is foreseen for the composition of ACPSN, with professionals such as pedagogue, psychologist, social worker, specialists in specialized educational service (SES) and assistive technology, in addition to teachers (BRASIL, 2018).

It is important to note that, even guiding teachers and thinking about accessibility strategies established in their idealization, there is no legal institutionalization of the special educator as a professional specialized in the composition of this nucleus (ZERBATO, VILARONGA, SANTOS, 2021). In addition to the presence of the Special Education teacher in the nucleus, thinking about the guarantee of SES in the context of technological professional education is extremely important, not only idealizing this service as an after-hours service in a Resource Room (BRASIL, 2008b) but with the possibility of constant collaborative work with the common room teacher, with partnerships in the planning process.

Zerbato, Vilaronga, and Santos (2021) investigated the role of the Special Education teacher in the educational context of the IFs through the analysis of normative documents on the role of this professional in basic technical and technological education and the practice performed by him in everyday life of the institution. As a result, they found that the guarantee of the SES and the special educator for Basic Education and the partnership with other professionals are a relevant possibility for accessible education, considering the elaboration of the Individualized Educational Plan (IEP). In this case, the IEP is defined as a document centered on the SEN student that requires a careful and precedent evaluation, prepared in partnership by the professionals who work with it, family members, and the student, aiming to define the learning process (TANNÚS-VALADÃO; MENDES, 2018).

Aiming at discussing the role of ACPSN in two FIs, Sonza, Vilaronga, and Mendes (2020) developed a documental study based on the analysis of the guidelines for the actions of the ACPSNs and

the proposal to develop the IEP. As a main result, the movement of the nuclei to guarantee accessibility for students with specific educational needs is regulated in the guidelines and regulations of the institutes. However, there were different challenges in the performance of the nucleus because, although it has a relevant role in the IFs and despite all the effort made in teaching, research, and extension, this type of program demands a multidisciplinary network capable of carrying out individual measures, especially, to reduce the burden due to the absence of special education teachers to carry out Specialized Educational Service (SES), as prescribed by the Brazilian Law for the Inclusion of Persons with Disabilities (LBI) (BRASIL, 2015).

Santos (2020) analyzed regulatory documents for school inclusion and Individualized Educational Planning for SEN students in IFs, based on data collected on official websites of 38 institutions, in addition to the information provided by emails by professionals from the centers. A total of 105 documents were analyzed, finding few general regulations for Special Education, a diversified understanding of how ACPSN should work, and the identification of a few specific documents for individualized planning. The author also recognizes the action and dedication of ACPSNs professionals, indicating the relevance of effective policies for Special Education in IFs. However, research shows a still precarious scenario in teaching planning for SEN students.

With the Covid-19 pandemic, social distancing measures were required and face-to-face classes were suspended throughout Brazil at the beginning of the 2020 school year. With the possibility of maintaining teaching remotely, proposals for environments emerged of work and carrying out activities with the use of digital platforms. Thus, the issue of emergency remote teaching started to be discussed in the educational field due to its peculiarities (SAVIANI, 2020; SILVA; ANDRADE; SANTOS, 2020; VALENTE et al., 2020). According to Hodges et al. (2020, p.3), this term has come to be adopted "as a common alternative term used by online education researchers and professionals to establish a clear contrast with what many of us know as high-quality online education". despite being based on some strategies of the Distance Education (DE) model, it is not a synonym, since distance education has "regulated existence coexisting with face-to-face education as a distinct modality offered regularly" (SAVIANI, 2020, p.6), while remote learning was exceptionally admitted in the pandemic context, without being thought to work in a distance format.

In this context, research began to explore the new scenario and the possibilities of educational practices. Seeking to carry out a reflective analysis of teaching practice in remote teaching in times of pandemic, Valente et al. (2020) list several challenges experienced in a Brazilian federal university, indicating "the technological support for students to monitor remote activities, the regulation of actions and procedures, the training of teachers to carry out this practice" (VALENTE et al., 2020, p.6). In addition to these aspects, the authors discussed issues related to the habit of traditional practices, which would need to be reviewed and modified using other resources and languages.

When analyzing the instruments used by teachers during remote teaching, Silva, Andrade, and Santos (2020) identified the adherence of digital tools by teachers on a campus of the *Instituto Federal do Maranhão*. Despite having difficulties in accessing the internet and with little knowledge about digital tools, the teachers organized asynchronous and synchronous classes, as well as the preparation of content and specific projects for the students. Regarding the inclusion and initiatives during the pandemic, Moro, Corrêa, and Valentini (2021) carried out a mapping of the documentation adopted by the *Instituto Federal Rio Grande do Sul*. The study found the adoption of normative guidelines in line with the public policies of inclusive education; however, they need to reiterate the focus on the student in the remote context, being necessary that the documents consider the importance of technology, information technology, and the internet access.

From the several issues raised, considering aspects related to teaching planning aimed at the SEN students and the implications imposed by the context of the pandemic and remote teaching, the study started from the problem of how this context impacted teaching planning, accessibility, and permanence in the IFs. Thus, this study aims to analyze the practice of educational planning for SEN students in IFs in the context of the Covid-19 pandemic.

## METHOD

The research is classified as exploratory and descriptive, a survey, using the questionnaire as an instrument for data collection. The research was developed in the context of the Federal Institutes of Education, Science and Technology (*Institutos Federais de Educação, Ciência e Tecnologia* - IFs), considering the national territory, together with professors from different campuses, courses, and subjects offered in these institutions that taught classes in remote teaching during the Covid-19 pandemic period, from March to December 2020, with SEN students. The Professional Network is broader than the IFs, but this research universe was selected because it brings together institutions with similar characteristics.

This type of research enables the investigation of the behaviors of the participants at a given moment and changes in attitudes over time. The technique used to define the sample was non-probabilistic, by convenience. One of the advantages of defining the type of sample is the ease of obtaining a greater number of participants but at the risk of not having an accurate representation of the population (COZBY, 2003).

The study respected the ethical aspects, carried out after approval by the Ethics Committee of UFSCar, CAAE 2 30897020.6.0000.5504, and the consent of the participants about the objectives, risks, benefits, and participation voluntarily, with the consent of the Informed Consent Form (ICF).

The questionnaire used is a self-completion instrument prepared on a questionnaire by Lacerda and Mendes (2016), consisting of 39 questions, mostly closed-ended, in multiple-choice format, with an alternative answer or selection box. The participant could tick more than one option and with three essay questions, is divided into ten sections. The first section corresponds to the presentation of the research and acceptance of the ICF, the second aims at the identification and characterization of the participants, while the other sections explore aspects related to educational planning for SEN students in IFs in the period of remote teaching developed in the context of the pandemic of Covid-19, covering the following themes: Pedagogical practice: organization to plan to teach; Characterization of the current work of SEN students; Specific planning for the SEN students; Structure of the specific planning for the SEN students; Infrastructure; Characterization of pedagogical practice; Assessment of teaching and learning of the SEN student; Considerations about work in remote teaching.

To select the participants, the study was publicized on a social network and via electronic address, whose e-mails were available on the websites of the IFs. An invitation was sent to professors or addressed to the communication sectors, ACPSN, teaching department, and/or course coordinators, requesting sharing with professors, covering all institutions. The invitation contained a brief presentation of the research proposal and the access link to the questionnaire, which could be filled out based on the interest and acceptance of the participants. Data were collected in a virtual environment, using the Google Forms digital form tool, with an estimated time of 15 to 20 minutes for filling. None of the questions had a mandatory answer, and the participant could answer partially, leaving any question blank or even withdrawing consent and not completing the completion and sending of their answers.

We systematized and tabulated the data obtained. We analyzed the multiple-choice questions which are presented in numerical data and percentage for the total number of participants. The checkbox questions are presented only in numerical data, considering that the same participant could indicate more than one answer, as well as the discursive questions, in which we sought to analyze the discourses on common themes. The data were organized into thematic categories defined, a priori, from the sections of the instrument.

The study involved the participation of 156 teachers from the IFs, regular education teachers from different institutions and campuses who met the inclusion criteria: being a teacher on one of the IFs campuses, teaching classes in remote learning in the context of the Covid-19 pandemic with SEN students. Thus, we obtained the answers from 25 campuses. The highest number of participants was the northeast region with 45 (28.8%) professors, followed by the southeast region with 42 (26.9%). The southern region had 30 (19.2%) participants, the mid-west region had 22 (14.1%) and the north had 17 (10.9%) professors. Some institutions differ in terms of the number of participants in the sample, corresponding to 58.3%, such as the professors *in the Instituto Federal de São Paulo* (IFSP) with 27 (17.3%),

the *Instituto Federal de Goiás* (IFG) with 12 (7.7%), followed by the *Instituto Federal de Goiás* (IFPR), *Instituto Federal de Goiás* (IFRS), *Instituto Federal da Paraíba* (IFPB) and *Instituto Federal de Rondônia* (IFRO) with 11 (7.1%) professors each and the *Instituto Federal de Rondônia* (IFBA) with eight (5.1%) participants. The other institutes had six participants or fewer.

Some participants indicated that they have a disability, with hearing impairment, intellectual disability, and high skills and giftedness by one teacher (0.6%), and physical disability by two (1.3%) teachers.

Table 1 shows the main characteristics of the participants.

**Table 1** - Characterization of the participants

| | | n (%) |
|---|---|---|
| **Age group** | Up to 30 years old | 13 (8.3) |
| | Between 31 and 40 years old | 61 (39.1) |
| | Between 41 and 50 years old | 47 (30.1) |
| | Between 51 and 60 years old | 23 (14.7) |
| | More than 61 years old | 6 (3.8) |
| | Not specified | 6 (3.8) |
| **Time teaching** | Up to 3 years | 11 (7.1) |
| | 4 to 10 years | 45 (28.8) |
| | 11 to 20 years | 63 (40.4) |
| | More than 20 years | 37 (23.7) |
| **Initial formation** | Graduation | 92 (59.0) |
| | Bachelor degree | 53 (34.0) |
| | Technological | 7 (4.5) |
| | Not specified | 4 (2.6) |
| **Titration** | Ph.D. | 67 (42.9) |
| | Master's degree | 67 (42.9) |
| | Specialization | 20 (12.8) |
| | Without titration | 2 (1.3) |

Source: Our creation

In their initial training, only 31 (19.9%) participants indicated that their training course included contents on Special Education, pointed out in one subject by 23 (14.7%) participants, in two subjects by two (1, 3%), and three or more subjects in six (3.8%) responses.

Of the 156 participants, 65 (41.7%) did not answer the question regarding the special education theme addressed in initial training, for 62 (39.7%) participants the theme did not apply to those listed or did not remember, only 29 (18.6%) indicated some topic. The topics addressed in the initial training indicated by these participants are represented only in numerical data, as the teachers could choose more than one option: Fundamentals of Inclusive Education or Special Education in 16 answers; Deafness in 13; Hearing Impairment in 11; ASL in nine; Blindness in nine; Physical Disability in nine; Intellectual Disabilities in seven; Autism or Pervasive Developmental Disorder in seven; High Abilities or Giftedness IN seven; Low Vision in six; Multiple Disability in five and; Deafblindness in four answers.

Regarding continuing education, 117 (75.0%) participants indicated that they had taken courses in recent years, which could be indicated in more than one area. Forty responses referred to courses in the area of Inclusive Education, 22 in Special Education, and 82 in other unspecified courses.

## RESULTS AND DISCUSSION

Educational planning is a process from the teaching exercise that encompasses the actions of educators and their relationships with students (FUSARI, 1989). As a result of the planning process, the teaching plan is defined, which presents descriptions and guidelines on the deliberations to be followed (HAYDT, 2011). According to Fusari (1990), the teaching plan is a document designed by the teacher or together with other teachers, covering the work proposals of a particular subject or area, and it is the document that will guide the teaching work, elaborated during the planning process.

In the context of the Covid-19 pandemic, with the interruption of face-to-face classes, institutions in some cases chose to promote the teaching virtually. According to Hodges et al. (2020), in the circumstance in which remote teaching was structured with minimal resources and in a short time due to the emergency crisis, learning may not be offered in a fully planned and effective way. However, planning should include support for the different types of interaction in the teaching and learning process, also identifying the content to be addressed, providing support and access to this content in a temporary, fast, easy-to-configure, and reliable way.

Regarding the organization to plan remote teaching, 126 (80.8%) teachers indicated that they participate in collective planning. Most of the time, 40 (25.6%) participants indicated the biannual frequency of planning, followed by 22 (14.1%) participants and monthly by 21 (13.5%) participants, while the others indicated other time intervals. In addition, 26 (16.7%) indicated the non-existence of this moment. As for the time dedicated to planning in the context of remote teaching, we observed the use of five to ten hours in the weekly routine by 34 (21.9%) participants and three to five hours by 32 (20.6%). Periods longer or shorter than these were pointed out by a smaller number of professors. The practice of planning was intensified in remote teaching, according to Alberto et al. (2020), in a study carried out on the reality of the IFTM, the pedagogical processes were replanned due to this change, as well as measures were taken to maintain the academic calendar and to propose remote teaching to students. Among the guidelines implemented by the institution, we found the planning meetings, considering the guarantee of access to education and the elaboration of measures relevant to the planning of actions.

To understand the practice of educational planning for SEN students at IFs in the context of the pandemic, we sought information from the students with whom the research professors worked. Table 2 shows the identification of these students and the course they attended.

**Table 2**- Identification of students with SEN

| **SEN** / **Course attended** | **Integrated technical course** n (%) | **Higher education course** n (%) | **Technical course** n (%) | **Postgraduate course** N (%) | **PROEJA integrated technician** n (%) | **Unspecified course** n (%) | **Total n (%)** |
|---|---|---|---|---|---|---|---|
| Deafness | 23 (14.7) | 5 (3.2) | 11 (7.1) | 3 (1,9) | 1 (0.6) | | **43 (27.6)** |
| Intellectual Disability | 24 (15.4) | 7 (4.5) | 4 (2.6) | | | | **35 (22.4)** |
| Autism or other Pervasive Developmental Disorder | 17 (10.9) | 2 (1.3) | 2 (1.3) | | 1 (0.6) | | **22 (14.1)** |
| Low vision | 11(7.1) | 3 (1.9) | 3 (1.9) | 2 (1,3) | | | **19 (12.2)** |
| Hearing deficiency | 8 (5.1) | 3 (1.9) | 4 (2.6) | | | | **15 (9.6)** |
| Blindness | 7 (4.5) | 3 (1.9) | | | | 1 (0.6) | **11 (7.1)** |
| Physical Disability | 4 (2.6) | 3 (1.9) | 1 (0.6) | | | | **8 (5.1)** |
| Multiple Disability | | 1 (0.6) | 1 (0.6) | | | | **2 (1.3)** |
| Deafblindness | 1 (0.6) | | | | | | **1 (0.6)** |
| **Total** | **95 (60.9)** | **27 (17.3)** | **26 (16.7)** | **5 (3,2)** | **2 (1.3)** | **1 (0.6)** | **156** |

Fonte: Elaboração própria

As we see in the table, the highest number of SEN students with deafness was identified, followed by those with intellectual disability, Autism or other Pervasive Developmental Disorder (PDD), and low vision. Regarding the course attended, most SEN students were enrolled in the Integrated Technical Course, followed by the Higher Education Course and the Technical Course. The reservation of vacancies for SEN students in institutes is now guaranteed through the quota system policy, established by Law 12,711 (BRASIL, 2012) and its amendment by Law 13.409 (BRASIL, 2016), stating about the reservation of vacancies for people with disabilities in technical courses at the secondary and

higher levels of federal educational institutions, enabling an increase in the number of enrollments of these students.

Regarding the participation in activities during remote teaching, 147 (94.2%) participants stated on student involvement, and 12 teachers (7.7%) reported non-participation of SEN students in activities. The participation of SEN students in only a few activities was reported by 36 (23.1%) professors, of which in 20 (12.8%) situations SEN students required occasional help. Participation in all activities was indicated by 99 (63.5%) professors, and SEN students participated only with assistance in 48 (30.8%) indications, with assistance in some situations in 36 (23.1%) and do not need assistance in 19 (12.2%) answers. Although the results indicate that most of these students participated in activities in remote teaching, the need for support was the most indicated, and the percentage of students excluded from the activities was observed. In this sense, the results raise some unanswered questions due to the format of the instrument used and that can be investigated in future studies, such as: Who is helping these students? Is the aid provided for remote teaching? Are there strategies designed to reach those who have not participated or is there just the suppression of activities?

In this sense, 149 (95.5%) professors indicated the need to perform some differentiated procedure for the participation of the students with SEN, with 32 (20.5%) professors manifesting that they do this in all activities and 44 (28.2%) doing it in mostly all activities. Also, 45 (28.8%) professors indicated that they had made some differentiation, but not frequently, while 28 (17.9%) participants indicated that there was no need for any procedure. Table 3 shows the types of differences identified in the structure of the specific planning for the SEN student during remote teaching.

**Table 3**- Structure of the specific planning for the SEN student [6]

| Differences in planning | Yes n (%) | Partly n (%) | No n (%) | Not applied n (%) | Not specified n (%) |
|---|---|---|---|---|---|
| **Objectives** | 72 (46.2) | * | 72 (46.2) | 12 (7.7) | |
| **Evaluation ways** | 50 (32.1) | 62 (39.7) | 42 (26.9) | 2 (1.3) | |
| **Teaching materials and resources** | 39 (25.0) | 69 (44.2) | 43 (27.6) | 5 (3.2) | |
| **Contents** | 22 (14.1) | 36 (23.1) | 95 (60.9) | 2 (1.3) | 1 (0.6) |

Source: Our creation

When the elements of the curriculum are associated with the learning of SEN students, the differences in the instructions thought and planned with specific objectives to accommodate the individual characteristics of the students, not being considered as a simplification of the curriculum or, even, a decision-making process that aims to simplify the teaching and learning processes. Curricular differentiation is understood as "changes in methodology and assessment, assuming that students have the same path in their options, but that some need to follow different paths so that everyone can achieve educational success" (PACHECO, 2008, p. 182). Thus, the elements of the curriculum are not independent, when applying a curricular differentiation, the possibilities of access of SEN students to knowledge are improved, not reducing the possibilities of teaching and learning, which does not mean the mere suppression of objectives and content by the no guarantee of accessibility.

Data analysis reflects the relationship between the differences in each element and the specificities of the SEN. In the objectives of the subjects proposed and approved in the Pedagogical Project of the Course, their differentiation was indicated, mostly, for those with intellectual disabilities, deafness, and Autism or PDD. Regarding the content, which is thought by the professor based on the objectives of the subject, we identified differences for students with intellectual disabilities, deafness, hearing impairment, blindness, and multiple disabilities. The number of professors who made differences in objectives and contents, in whole or in part, is equivalent to those who did not. For most students with autism or PDD, no differentiations were reported, and some professors indicated the need to differentiate the content in part. The largest number of professors who indicated no differentiation in objectives and content referred to their students with physical disabilities, deafblindness, and low vision. This result raises questions about the justifications for these differences, especially for students who are

[6] Data referring to the option "Partly", the "Objectives", was not asked.

deaf or with autism or PDD, about which professionals and based on what assumptions these strategies have been idealized and whether students participate in this decision-making. Also, we need to consider the possibility of resuming content and objectives based on time flexibility or reflecting on the possibility of mere unjustified suppression.

As for teaching materials and resources, its differentiation was pointed out in greater numbers among students with intellectual disabilities, hearing impairment, low vision, deafblindness, and deafness. Deafness coincides with the number of professors who fully adopted it. As for the non-differentiation in these elements, professors of students with physical disabilities and autism or PDD were highlighted.

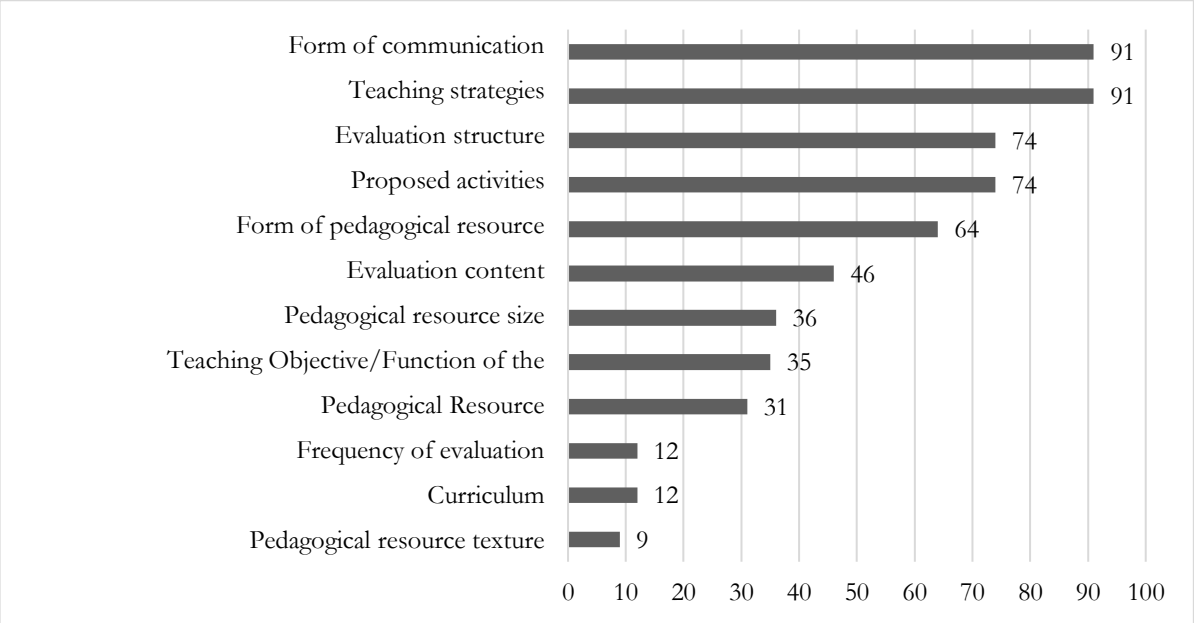
Regarding the evaluation, we found that the differentiation was proposed in greater numbers with students with intellectual and hearing disabilities, as well as those with deafness, being this differentiation total or partial. For students with low vision, physical disabilities, and deafblindness, the most informed was not to adopt differentiation in this element.

According to Resolution CNE/CEB nº 2 (BRASIL, 2001), respecting the principles of inclusive education, schools in regular professional education networks, both public and private, must guarantee students with special educational needs curricular accessibility through flexibility and adaptation, as well as promoting referral to work, with the participation of the special education sector of the education system. In the study developed by Santos (2020) about the documents that support the specific planning for SEN students in the IFs, we found that they did not follow a single pattern, demonstrating the lack of systematization and the lack of a guideline for the elaboration of this plan nationwide in the IFs network.

Studies on curriculum differentiation in the context of IFs are scarce, and most of them discuss issues related to curriculum adaptations. Some institutes offer guidance to professors who work with SEN students so that they can improve their pedagogical practice. This situation is exemplified in the study by Bettin (2013) about the reality of the *Instituto Federal de Educação, Ciência e Tecnologia Sul-rio-grandense/Campus Pelotas*, which provides guidance provided by course coordinators and pedagogical supervision for teachers. However, the author argues that this process is still complex in the development of more assertive pedagogical practices, and the process of curricular adaptation for these students, which requires investment in the continuing education of teachers and expansion of the guidelines provided. Regarding the planning of activities, Rocha (2016) pointed out that this process would be related to the peculiarities of each student and the training of teachers, and its results indicate that teachers show more difficulties when the disability requires more specific adaptations.

In the context of the research, 123 (78.8%) teachers indicated that they made changes in their pedagogical practice to work with the SEN student during remote teaching which 97 (62.2%) partially made them. The changes made in the SEN student's education mode are shown in Graph 1, teachers could choose more than one option, so we chose to represent them in numerical data.

**Graph 1 -** Modifications in pedagogical practice




Source: Our creation

The most indicated changes made were the teaching strategies and the form of communication, appearing in 91 answers, considering that teachers could select more than one option. Modifications in proposed activities and evaluation structures were also emphasized in 74 answers and the form of pedagogical resource in 64 answers. Other changes mentioned were for the size of the pedagogical resource, in 36 answers, and the teaching objective/function of the pedagogical resource indicated in 35 answers. Changes in the curriculum were pointed out by 12 teachers. These results indicate a way of thinking about ensuring accessibility by teachers for at least a portion of these students.

Regarding curriculum adaptation practices, in a study carried out under IFRS, the authors highlighted that this process involved the analysis and evaluation of the classroom environment and space, the student's life and education history, acquired, and the possible advances in the process of acquiring new knowledge. However, the adaptation process was still identified as a challenge for professionals who worked on campus, requiring further reflection on the development of an inclusive curriculum (SONZA; DALL AGNOL; SALTON, 2018). These practices also showed similarities in remote teaching, in which some proved to be more important than others. A facilitator of the process was the teaching of students who were already at the institution before the pandemic, as they were already known and there were previous strategies.

As a differentiation in their practice in remote teaching, some teachers reported the provision of specific services, individualized support, and/or extra activities for SEN students, using strategies that allowed greater contact with the student, more detailed explanations of the theory, moments to answer questions doubts and extension of the deadlines for the accomplishment of the activities. Also, part of the participants mentioned the use of email and/or additional private messaging applications, such as WhatsApp, for communication and exchange of information and materials between the teacher and the student. The communication application was also indicated by the possibility of communication via audio.

Regarding the methodologies and technological resources used, the teachers raised several ways to deal with the current situation such as the use of videoconferences, lectures through online platforms, production of video classes available on YouTube or through groups of WhatsApp, with the cell phone and notebook as its main technological resource. Another resource was the availability of electronic handouts through Google Classroom, printed activities for students who did not have access to technological resources, concept maps, an indication of films, among other methodologies.

The technological issue had positive and negative aspects in the opinion of the group of teachers participating in the research. Regarding the transition to remote work, the participants indicated

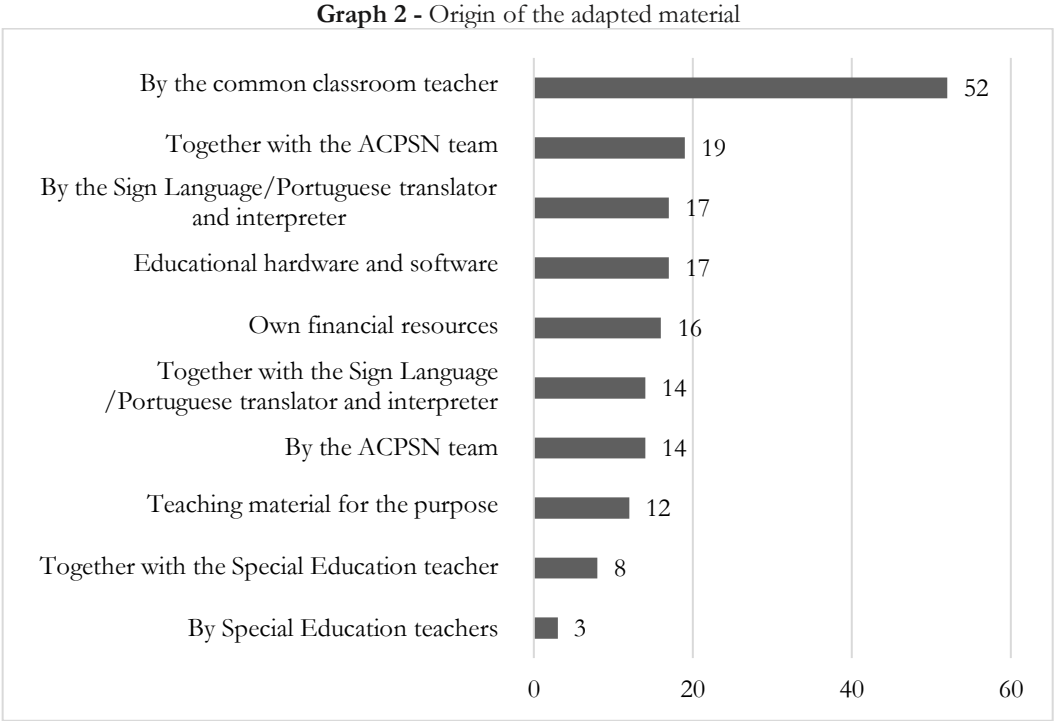
some challenges experienced in this process, being able to indicate more than one answer, being represented in numerical data. More frequently, lack of familiarity or comfort using remote technologies/applications and access to reliable internet service were reported by 75 participants, and difficulty downloading/running work-related software or applications by 64. However, some participants described the use of technologies to facilitate remote learning as a possibility such as computers, software, general and messaging applications, such as WhatsApp, mentioned by 23 teachers, and the use of digital tools, such as Google Meet, by four teachers. The possibility of providing audiovisual materials to students was cited by 11 teachers, and the use of digital resources and new forms of teaching as aids in the teaching and learning process by nine. Studies such as those by Valente et al. (2020) and Silva, Andrade, and Santos (2020) cited the use of applications and social networks as facilitators of the communication process, file sharing, and access to virtual classrooms in the context of remote teaching.

The use of adapted teaching material was reported by 114 (73.1%) participants, used sometimes by 41 (26.3%) teachers, often by 26 (16.7%), rarely by 25 (16.0% ), and always by 22 (14.1%).

In the context of remote teaching, the support of translators and/or interpreters of Sign Language/Portuguese Language was identified by the participants, seen both as a challenge, mentioned by ten professors, and a possibility, considered by nine participants. Some participants considered the interpretation and/or translation into Sign Languages/Portuguese of the materials and activities as one of the main differences in remote teaching, and the adaptation of specific materials for students, such as visual content or in larger resources. Another change was the provision of written materials or additional activities for students, mentioning the preparation of handouts, summaries, cards, extra activities, auxiliary texts, mental maps, study guides, and greater use of visual content.

LBI (BRASIL, 2015) ensures the production of teaching materials and the use and development of technological resources and systems, which must be guaranteed by the educational system. In remote teaching, these systems and materials did not seem sufficient to support the teaching process and some teachers needed to customize and adapt existing materials to the format that best adapted to the context. The technological challenges to access the online platform were present for some students and teachers. Graph 2 shows the origin of the material in the numerical data.

**Graph 2 -** Origin of the adapted material




Source: Our creation

Some of the participants indicated more than one source of origin. We observed that most of the teachers mentioned that the adaptation of the existing material was done by themselves, indicated in 52 answers. The use of didactic hardware and software for specific use was also indicated in 17 answers; own financial resources, when the teacher bought material to create his teaching material or adapted, in 16 and own teaching material, industrially produced for this purpose, by 12 participants. Adaptation together with the ACPSN team was also mentioned in 19 answers or by the team in 14, as well as by the Sign Language/Portuguese translator and/or interpreter, indicated by 17 participants, or together with this professional, by 14. On the other hand, there were few answers about the adaptation made together with the Special Education teacher, indicated by only eight teachers, or by this specialist, mentioned by three.

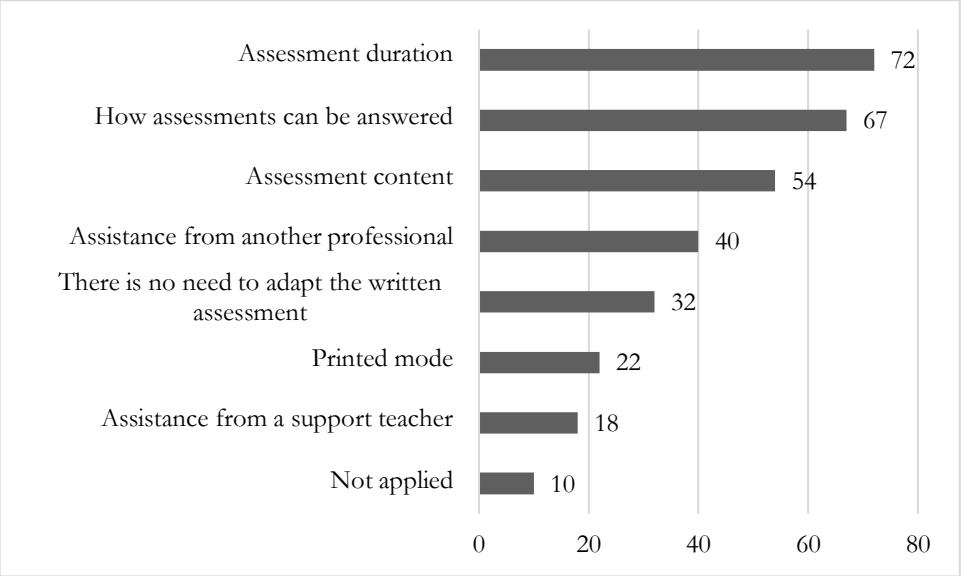
Studies carried out in the context of Secondary and Technological Education pointed out that common classroom teachers recognized the importance of closer dialogue with Special Education teachers since this approach would favor the actions and adaptations to be developed. Therefore, the planning together would enrich the teaching work and the participation and learning of these students (COSTAS; HONNEF, 2015). A similarity can be seen in the importance of ACPSN in pedagogical training, considering the identification of students with specific needs. To achieve the best education for these students, teachers need adequate training to provide quality teaching in the best possible way. The important activities seem to revolve around transforming school content into appropriate and relevant materials for students with special needs. In the remote context, there was a need to adapt to each specificity, and this task of change required the acceptance of the new reality and, in this perspective, the school needed to find solutions to the challenges faced.

According to Viana and Carvalho (2017), the presence of ACPSN at school would be very important for students and parents, as well as for monitoring student progress. ACPSN aims to encourage, mediate and facilitate the teaching and learning process of students with specific needs (SANTOS, 2020) and has experience in identifying SEN students who enter the IFs, in adapting teaching materials, together with teachers and a team of specialized professionals, favoring the school inclusion process of these students in the institutes.

Although the role of the special education teacher is not legally foreseen in all IFs, the work of ACPSN should be valued for performing the dialogue and guidance of teachers in the development of evaluation instruments and curricular adaptations for SEN students (MAEKAVA, 2020). However, Santos (2020), when analyzing the school inclusion policy in the IFs, found that the ACPSNs team had fewer professionals with specialized technical knowledge to assist the students with SEN, such as translator and/or interpreter of Sign Language/Portuguese, teachers of special education and Braille proofreader, when compared to the other professionals who made up the nucleus, such as pedagogues, administrative technicians, and psychologists. We can highlight that in each IF there is a different physical and human structure, with no guarantee of the majority of professionals assured in the LBI.

Regarding the assessment process, Costas and Honnef (2015) pointed out that teachers consider that the assessment of students with SEN and other students with educational needs, could be better planned in partnership with the special education teacher, as they would apply different knowledge that would be unified in the elaboration of the evaluation process. Changes made in written assessments were also reported in remote teaching, and it is possible to indicate more than one option, as shown in numerical data in Graph 3.

**Graph 3** - Modifications to the assessment

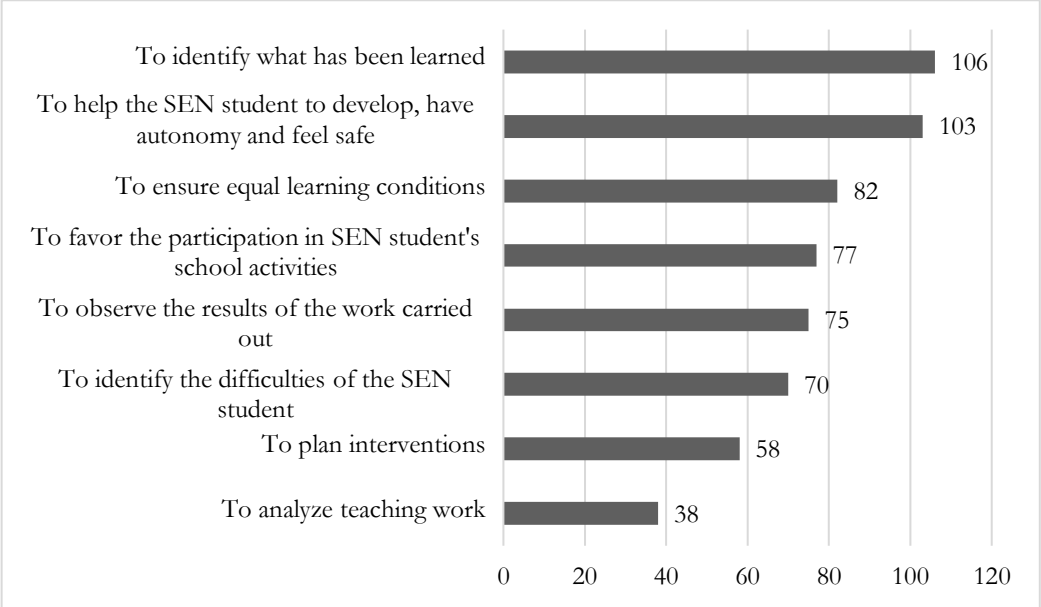



Source: Our creation

The modifications that stood out were those related to the duration of the assessment, indicated in 72 answers, followed by how the assessment could be answered, in 67, and by the modification in the content of the assessment, in 54. The help of another professional was indicated by 40 participants and the help of a support teacher just by 18. Thirty-two participants mentioned that there was no need to adapt the written assessment and for ten teachers this question did not apply to their experience. Some examples of the differences reported were related to the assessment offer, including: visual adaptation with image exploration; reduced assessments, with fewer assessment activities; time flexibility; oral test; continuous assessments carried out every week to ensure minimum grade for the student and; assessments carried out through a questionnaire. Although modifications were made, these results point to questions for future investigations, such as: How would these resources be provided remotely? How was the time of these studies organized for these students? What was the number of parallel activities and what did the set of subjects represent as an overload for students?

In addition to the ways of modifying the evaluation process, the teachers answered about the objectives in the evaluation of teaching and learning. In this aspect, the participants could indicate more than one item when applied, with the numerical data presented in Graph 4.

**Graph 4** - Objectives during the assessment for students with SEN




Source: Our creation

As we see in the graph, the objective of the assessments that appeared more frequently was to identify what was learned, in 106 answers, to help the SEN student to develop, have autonomy, and feel safe, 103, followed by ensuring equal learning conditions, in 82. Other significant objectives were related to favoring the participation in school activities of the students with SEN, indicated by 77 teachers, observing the results of the work carried out by 75, and identifying the difficulties of the SEN student, by 70 participants. The least mentioned objectives were related to planning interventions, in 58 answers, and analyzing teaching work, in 38.

In the context of emergency remote teaching, Hodges et al. (2020) highlighted the need to verify whether the results of learning assessments are consistent with the circumstances of the period, as well as to consider the participation and involvement of students, considering that the sudden change in the structure and organization of teaching has shaken everyone in the educational context, involving aspects related to life at the time of crisis. In this sense, we can highlight the flexibility of deadlines for tasks and institutional and course policies, considering that the use of asynchronous activities may be more appropriate than synchronous ones. The authors also discussed the evaluation process of emergency remote teaching, considering that it must involve everything needed for the development of teaching in the context of the pandemic crisis, in a short time, emphasizing the context and elements of the process.

To present an overview of the actions of the IFs to mitigate the effects of the pandemic on academic activities, Castilho e Silva (2020) reflected on the homogeneity of these actions within the institutes regarding equal access to education in this exceptional context. The authors pointed out that the actions were different depending on each institute and situation in the region, and the IFs were concerned with following the guidelines of the World Health Organization and other regulatory bodies such as MEC, Conif, and the Ministry of Health. They also highlighted the concern of the IFs to guarantee quality and equitable education for all students.

Regarding the contact with the students, the participants commented on the difficulty in communication and interaction, reported by 31 teachers, the challenge to promote the motivation and interest of the class in the remote class and to monitor the student's progress and the teaching and learning process, both described by 12 participants, and individualized care with needy or disadvantaged students, who needed more attention from teachers to deal with the study, cited by ten.

However, some teachers saw in remote teaching the possibility of providing individualized services, such as extra classes, extensions of deadlines, or more personalized service, emphasizing in this context needy students, also reported by ten participants. Other possibilities mentioned were carrying out planning and understanding the student's needs and the process during remote teaching, mentioned

by eight teachers, adapting materials and activities, by seven, the ease of identifying the student's difficulties and providing solutions for them and having flexibility in the learning time and the definition of the student's schedule, both reported by four professors.

The involvement of the students' families was also punctuated by six professors, considering the possibility of ensuring adequate study routines, strengthening the bond with the student, and obtaining help from family members. On the other hand, in the context experienced by some professors, this aspect was seen as a challenge, considering the little family support offered to students in the context of non-face-to-face activities, described by five participants. In this sense, the student's parents play a fundamental and important role in the development process at all levels of education (SANTOS, 2020) and family involvement in the educational process is a strong foundation for the student in the case of remote teaching.

Among the possibilities and challenges commented by the teachers, some participants mentioned the difficulty in communicating and interacting with other teachers, little or no training for this new way of teaching, as well as the challenges of reconciling the work done at home with the family routine, work overload, and lack of adequate space and/or furniture. When problematizing the challenges, teaching knowledge and training needs for non-face-to-face teaching at IFs, Nunes, Paniago, and Sarmento (2020) point out that, to practice teaching at IFs, academic training linked to teaching was not required and this implied having teachers without a degree, but with bachelor's and engineering degrees, which can create challenges in teaching planning for all students. For the authors, it would be necessary to think about continuing education to provide conditions for the exercise of professional and technological education. In the specific context of COVID-19, in addition to the challenges present in teacher training in Brazil, the authors highlight that teachers had been facing many challenges, such as unpreparedness to deal with technologies, the organization of strategies, and digital resources.

In this sense, Hodges et al. (2020) discuss the importance of the faculty being prepared for emergencies such as the one experienced, evaluating the process experienced in the implementation of emergency remote teaching, and of including professional training programs for everyone in the educational context.

## FINAL CONSIDERATIONS

The context of the Covid-19 pandemic imposed an emergency effort for the continuity of education around the world. In the Brazilian context, with the interruption of face-to-face classes, educational institutions sought different alternatives for maintaining the academic calendar and for the proposal of remote teaching, requiring the replanning of pedagogical processes. In this study, most of the participating teachers indicated their participation in the collective planning for remote teaching. The demand to meet the educational needs of SEN students required a considerable investment by teachers to develop an accessible teaching plan and ensure involvement and learning, with most participants punctuating the performance of differentiated procedures for these students.

Regarding the specific planning, the differences in the objectives for the SEN students were indicated by half of the professors. In the content, most teachers mentioned not having made any differentiation. In the question regarding materials and resources and the evaluation, most of the answers suggested their partial differentiation. We observed that the differences in these aspects were less marked for the work with students with physical disabilities, low vision, and deafblindness.

The differentiations aim to accommodate the individual characteristics of students, providing access to students with SEN to teaching and learning. For this, curriculum accessibility must be guaranteed through flexibility and adaptation, in addition to counting on the participation of the special education sector of the education system. In the literature about the context of the IFs, the lack of standardization, systematization, and guidelines of the elaboration of the individualized teaching plan of national scope in the network is revealed.

The study also highlighted the changes in pedagogical practice for working with SEN students in remote teaching, stated by most participants. The most indicated changes were for the teaching strategies, the form of communication, changes in the proposed activities, and the evaluation structure. The teachers raised several ways to deal with the current situation, with the virtual environment

being considered an important means of contacting students and offering remote teaching, with the use of digital platforms, various applications, and the use of social networks. They also mentioned the use of printed activities for students who did not have access to technological resources.

The technological issue had positive and negative aspects in the opinion of the group of teachers participating in the research. The lack of familiarity and comfort using the technological resources was one of the main challenges indicated by the teachers. However, some teachers considered these resources favorable to the development of remote teaching as auxiliaries in monitoring the teaching and learning process, communication with students, and the availability of materials.

The study also found that most teachers used adapted teaching material, highlighting the performance of these procedures by the common room teachers. Adaptation was mentioned together with the ACPSN team, with the translator and/or interpreter of Sign Language/Portuguese Language or made by these agents. However, the professional specialized in Special Education was considered by only 7% of the participants.

In the evaluation process, about a third of the participants indicated the help of another professional or support teacher. The production of teaching materials and the use of technological resources and systems must be guaranteed by the educational system as part of the special education process. Also, the assessment process can be better planned in partnership with the special education teacher.

In the context of the IFs, the guidance to teachers for curricular adaptations and the elaboration of evaluation instruments is performed by ACPSN. However, the literature indicates that the team that composes it has few specialized professionals to attend to the SEN students, and the role of the special education teacher is not legally provided in all IFs. In face-to-face teaching, if the existence of a specialized professional is required and of paramount importance in collaborating with teachers in meeting the demands of the SEN students, their absence in the context of remote teaching may reflect the little involvement and lag in the teaching and learning of SEN students.

The context experienced by the Covid-19 pandemic, with the interruption of face-to-face teaching and the adoption of emergency remote measures, caused different actions depending on each institute and the situation of the region in which it is located. We know that educational institutions had to adapt with few resources and time, is necessary that the planning of general or specific education to the SEN enabled the support to the interactions of the teaching and learning process and access to the content. Among the possibilities and difficulties, in addition to aspects related to the use of technology, the participants raised both opportunities and challenges in remote teaching for the interaction and monitoring of learning, individualized care, and the involvement of students' families. Other relevant obstacles reported include issues related to little or no training for this new form of teaching, work overload, and lack of adequate space or furniture, having also to reconcile work at home with the family routine. In this sense, it is important to offer working conditions, continuing education, and training to teachers.

Finally, the study allowed us to characterize some of the practices related to educational planning for SEN students in IFs, considering the implications imposed by the context of the Covid-19 pandemic and remote teaching. However, some issues still require a more detailed investigation. Although the study reached answers from different IFs from all regions of the country, the results maintain the limitation of using the non-probabilistic sample. Thus, we suggest developing other research in the same context, seeking to deepen the aspects raised, evaluating the experiences of teachers during remote teaching, and exploring both the challenges faced and the opportunities to be taken advantage of for the learning of SEN students. These aspects will allow alternatives to review and overcome some of the difficulties experienced, either through the exchange of experience between teachers or collaborative training, which was not proposed for this study.

In the understanding of planning as something collective thought in the institution by different actors and in dialogue with students, it is a suggestion for future studies to analyze the view on the subject of other professionals who are mentioned in this article, in the context of a remote teaching in technological professional education, such as the special educator, multidisciplinary team,

coordinators, students, translators and/or interpreters of Sign Language/Portuguese Language, among others.

In conclusion, it appears that the Federal Institutes, due to the legislation that guarantees access quotas, have been facing the challenge of developing accessible education for students from the target audience of Special Education with few resources for some time. The presence of students with SEN combined with the lack of training for teaching of many of their professors and specialized professors may be favoring the search for more collective solutions by these institutions and by their professors. The context of the pandemic and remote teaching has only added even more challenges for these teachers to face a scenario where inequalities in access to technology, information, and knowledge have become more visible. The results show that, with their resources and, sometimes, with the support of colleagues and the institution, teachers are trying to adjust remote teaching to the needs of their students, whether or not they have special educational needs.

The initiatives of professors to provide differentiation for their SEN students seem remarkable, but this task would be much less challenging and costly if they had more support from specialized professionals, more training and if institutions better regulated individualized educational planning practices and strategies of differentiation, so that teaching came out of improvisation and moved towards the intentionality that it demands.

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Author 1 – Conceptualization; data curation; formal analysis; investigation; methodology; validation; visualization; writing - original draft; writing - proofreading and editing.
Author 2 – Conceptualization; data curation; formal analysis; investigation; methodology; validation; visualization; writing - original draft; writing - proofreading and editing.
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## DECLARATION OF CONFLICT OF INTEREST

The authors declare that there is no conflict of interest with this article.

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