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Articles Section

Learning mathematical content in Higher Education: the roles of Special Education teachers

Aprendizagem de conteúdos matemáticos no Ensino Superior: atribuições de professores de Atendimento Educacional Especializado

El aprendizaje de contenidos matemáticos en la educación superior: funciones de los profesores de apoyo educativo

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Abstract

The work of Specialized Educational Services (SES) teachers in Brazilian basic education is guided by national guidelines and institutional regulations; however, there is no specific documentation for higher education. The objective of this study was to characterize the responsibilities of SES teachers in the Mathematics Teacher Education programs at the State University of Paraná (Unespar). This is a qualitative field study conducted through semi-structured interviews with five SES teachers working at the institution's five campuses that offer the program. The results, based on regulations, the Index for Inclusion, and the interviews, highlight four categories of responsibilities: identification of needs, didactic-pedagogical mediation, technical-methodological development, and guidance related to mathematical content, revealing the scope and challenges of these professionals' work in promoting inclusive education.

Keywords: Teaching Responsibilities. Mathematics Teacher Education Program. Specialized Educational Services. Higher Education.

Resumo

A atuação dos professores do Atendimento Educacional Especializado (AEE) na Educação Básica brasileira é orientada por normativas nacionais e regulamentações institucionais, sendo que, para o Ensino Superior, não há documentação específica. O objetivo deste estudo foi caracterizar as atribuições dos professores de AEE nos cursos de Licenciatura em Matemática da Universidade Estadual do Paraná (Unespar). Trata-se de uma pesquisa de campo, de abordagem qualitativa, desenvolvida por meio de entrevistas semiestruturadas com cinco professores de AEE que atuam nos cinco campi da instituição que ofertam o curso. Os resultados, fundamentados nas normativas, no Index para Inclusão e nas entrevistas, evidenciam quatro categorias de atribuições: identificação de demandas, mediação didático-pedagógica, desenvolvimento técnico-metodológico e orientação relacionada aos conteúdos matemáticos, revelando a amplitude e os desafios da atuação desses profissionais na promoção da educação inclusiva.

Palavras-chave: Atribuições docentes. Licenciatura em Matemática. Atendimento Educacional Especializado. Ensino Superior.

Resumen

La labor de los profesores de Atención Educativa Especializada (AEE) en la Educación Básica brasileña se rige por normativas nacionales y reglamentos institucionales; sin embargo, en el ámbito de la Educación Superior no existe documentación específica al respecto. El objetivo de este estudio fue caracterizar las funciones de los profesores de AEE en los cursos de Licenciatura en Matemáticas de la Universidad Estatal de Paraná (Unespar). Se trata de una investigación de campo, de enfoque cualitativo, llevada a cabo mediante entrevistas semiestructuradas con cinco profesores de AEE que trabajan en los cinco campus de la institución que imparten el curso. Los resultados, basados en la normativa, en el Índice de Inclusión y en las entrevistas, ponen de manifiesto cuatro categorías de funciones: identificación de necesidades, mediación didáctico-pedagógica, desarrollo técnico-metodológico y orientación relacionada con los contenidos matemáticos, lo que revela la amplitud y los retos de la labor de estos profesionales en la promoción de la educación inclusiva.

Palabras clave: Funciones docentes. Profesorado de Matemáticas. Atención educativa especializada. Educación superior.

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1. Introduction

Since 2022, the State University of Paraná (Unespar) has had Specialized Educational Service Teachers (SEST) (*Professores de Atendimento Educacional Especializado*). As a guideline for the work of those professionals, Unespar approved Resolution n.º 021/2022-CEPE/Unespar in the same year, which addresses the procedures for developing the Individualized Education Plan (IEP) (*Plano Educacional Individualizado*) for students with disabilities, high abilities/giftedness and specific functional disorders in undergraduate and graduate programs. From this perspective, Joint Normative Instruction n.º 01/2024-PROGESP/PROPEDH/PROGRAD sets out procedures for registering the Planning of Teaching Activities (*Planejamento de Atividade Docente* – ePAD) and assigning SESTs at Unespar (2024). In addition, Resolution n.º 008/2024-COU/Unespar approved the Internal Regulations of the Center for Human Rights Education (*Regimento Interno do Centro de Educação em Direitos Humanos* – CEDH).

And it is from the context of this university, which has moved forward with certain responsibilities to consider Special Education in Higher Education, that we aim to characterize the responsibilities of Unespar's SESTs in the Mathematics teaching degree programs. We note that, depending on the SEST's course of action, these roles are strained and reframed in relation to the type of knowledge discussed, which is what we seek to discuss here.

The interest in this topic stems from the first author's academic background in Pedagogy, her professional experience in education, and her participation in teaching assistant activities in Higher Education at Unespar, which familiarized her with practices related to Special Education from the Perspective of Inclusive Education. By monitoring the work of the Special and Inclusive Education Center (SIEC) (*Núcleo de Educação Especial e Inclusiva*) team, specifically at the Campo Mourão *campus*, we identified implications related to the duties of SESTs that led us to reflect on the conflicts between this work and the specificities of Mathematics.

To this end, we studied: the guidelines of the *Index* for Inclusion (Booth; Ainscow, 2011), which guides inclusive processes in the field of Education; and Unespar Joint Normative Instruction n.º 01/2024, which addresses SESTs' responsibilities. The professionals' responses to the convergent themes of "identification of demand", "didactic-pedagogical mediation", "technical-methodological development", "guidance" and "mathematical content" were analyzed. We chose these convergent themes because they serve as benchmarks for SESTs' work, corresponding to both the dimensions of the *Index* for Inclusion (Booth; Ainscow, 2011) and the Unespar Joint Normative Instruction (2024), which addresses these professionals' responsibilities.

Given the above, this article is organized as follows: we address the study topic, present the methodological considerations, provide a brief theoretical review, characterize the professional profile of the research participants, and, finally, discuss the responses of the SESTs regarding the convergent themes, considering, above all, the mediation of this professional between the student and the learning of mathematical content by the students served.

2. Theoretical review of inclusive practices in educational environments

To substantiate the analysis of SESTs' responsibilities, we first present the guidelines that govern these professionals' work in the Brazilian educational system. The Operational Guidelines for Specialized Educational Services (SES) in Basic Education, Special Education modality (Brasil, 2009), list the duties of SESTs. The State Department of Education, through the Superintendence of Education, issued Instruction n.º 016/2011, which established criteria for SES in Type I Multifunctional Resource Rooms in Basic Education, in the areas of intellectual disability, neuromotor physical disability, pervasive developmental disorders and specific functional disorders (Paraná, 2011).

In Paraná's Higher Education system there is still no specific regulation, and the guidelines for Basic Education end up serving as a reference. To implement these guidelines, Unespar (2024) published a Joint Normative Instruction that defines the duties of SESTs. Also noteworthy is Resolution n.º 021/2022-CEPE/Unespar, which regulates the development of the Individualized Educational Plan (IEP) for students with disabilities, high abilities/giftedness, and specific functional disorders. These regulations guide SESTs' institutional activities. The regulations are analyzed in light of Special Education from the Perspective of Inclusive Education, which understands accessibility as a structuring condition of the teaching and learning process (Mantoan, 2003; Rodrigues, 2006).

Table 1 summarizes and compares these responsibilities between Basic Education and Unespar.

Table 1 – SESTs' responsibilities in the Unespar Joint Normative Instruction (2024), in Type I Multifunctional Resource Rooms in Paraná (2011) and in the Operational Guidelines for SES in Basic Education, Special Education modality (Brasil, 2009)

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Operational Guidelines for SES in Basic Education, Special Education modality (Brasil, 2009)	**Instruction n.º 16/2011-SEED/SUED (Paraná, 2011)**	**Joint Normative Instruction (Unespar, 2024)**
I – **Identify**, develop, produce, and organize services, educational resources, accessibility resources and strategies, taking into account the specific needs of students who are the target population of Special Education;	a) **Identify** students' special educational needs.	I. **Map** the educational needs of target students in the SES on the campus where they work.

Table 1 – SESTs' responsibilities in the Unespar Joint Normative Instruction (2024), in Type I Multifunctional Resource Rooms in Paraná (2011) and in the Operational Guidelines for SES in Basic Education, Special Education modality (Brasil, 2009)

(continuação)

II – **Prepare and implement a Specialized Educational Service plan**, evaluating the functionality and applicability of pedagogical and accessibility resources;	b) Participate in the psychoeducational assessment in the school context of students with indications of intellectual disability, neuromotor physical disability, pervasive developmental disorders, and specific functional disorders, in accordance with SEED/DEEIN guidelines.	II. **Guide students, teachers and family members** on procedures for planning SES, taking into account the specific potential and needs of students for the teaching and learning process.
III – Organize the type and number of services provided to students in the multifunctional resource room;	c) **Prepare a Specialized Educational Service plan** with **differentiated methodologies and strategies**, organizing it to address the pedagogical interventions suggested in the psychoeducational assessment within the school context.	III. Coordinate the pedagogical planning of the SES for each student receiving services, assessing the needs for **curriculum flexibility** to **prepare** the **Individualized Educational Plan** (IEP), together with other members of the SES team, teachers, students and, whenever possible, their family members or legal guardians, in accordance with CEPE Unespar Resolution n.º 021/2022.
IV – **Monitor** the functionality and applicability of **pedagogical and accessibility resources** in the general classroom of mainstream education, as well as in other areas of the school;	d) Organize a schedule for **individualized or small-group educational service**, which should be reorganized whenever necessary based on the student's academic development and needs, with the **participation of the school's educational team and the family.**	IV. Establish the type of activity (complementary or supplementary), the frequency, and the **specificity of the monitoring** of didactic-methodological mediation of teaching-learning in academic classroom activities, internships, after-school pedagogical service, home-based activities and other academic activities.
V – **Establish partnerships** with intersectoral areas in the development of strategies and the provision of accessibility resources;	e) **Register** all of the student's progress and difficulties systematically, according to the Specialized Educational Service plan and in consultation with the subject teachers.	V. **Develop pedagogical resources and strategies** for curriculum accessibility, inform the *campus* of the need to acquire assistive technology resources and evaluate their use by students in SES.
VII – **Teach and use assistive technology** to enhance students' functional abilities, promoting autonomy and participation;	f) Guide general education teachers, together with the teaching staff, in the flexibilization of the curriculum, assessment, and methodologies that will be used in the general education classroom.	VI. **Register SES activities** and submit a biannual educational report to SIEC for students or their legal guardians, for the purpose of **monitoring**, institutional record-keeping, and planning institutional policies for educational inclusion, in compliance with the General Data Protection Law.

Table 1 – SESTs' responsibilities in the Unespar Joint Normative Instruction (2024), in Type I Multifunctional Resource Rooms in Paraná (2011) and in the Operational Guidelines for SES in Basic Education, Special Education modality (Brasil, 2009)

(conclusão)

VI – **Guide teachers and families** regarding the pedagogical and accessibility resources used by the student;	g) **Monitor** the student's academic progress in the general classroom, with a view to the effectiveness of the interventions and pedagogical resources used in the Multifunctional Resource Room – Type I, in Basic Education.	VII. Be part of the Special and Inclusive Education Center (SIEC) and collaborate with the work of the multidisciplinary SES team. Sole paragraph: in cases where a permanent faculty member is justifiably unable to assume the coordination of SIEC, the SES faculty member hired under the CRES regime may assume the responsibilities of SIEC coordination for the same duration as their contract with UNESPAR.
VIII – **Establish coordination with teachers in the general classroom** to provide services, pedagogical and accessibility resources, and strategies that promote students' participation in school activities.	h) **Collaborative work** with course instructors in the development of inclusive pedagogical practices.	VIII. Participate in faculty board and SIEC meetings whenever convened by the faculty boards, SIEC, or DDH/PROPEDH. IX. Provide guidance to scholarship recipients, interns, and/or tutors affiliated with SIEC in Inclusive Special Education activities.
	i) Develop collaborative work with the families of students served in the Multifunctional Resource Room – Type I, in Basic Education, with the aim of discussing and sharing responsibilities for the pedagogical activities to be carried out.	X. Develop educational strategies to inform and **raise awareness among the academic community** to promote educational accessibility, taking into account the specific needs of students who are the target audience of SES.
	j) Participate in all activities included in the school calendar, especially the class council.	
	k) **Produce accessible teaching materials**, taking into account the specific educational needs of students and the challenges they face in mainstream education based on the curriculum pedagogical approach.	
	l) Register the attendance of students in the Multifunctional Resource Room – Type I, in Basic Education, in the SES's own attendance register.	

Source: Researchers' archive, adapted from Brasil (2009), Paraná (2011) and Unespar (2024), emphasis added.

To analyze SESTs' responsibilities at Unespar, we relied on the *Index* for Inclusion (Booth; Ainscow, 2011), a document composed of three dimensions: "creating inclusive cultures", "developing inclusive practices" and "producing inclusive policies".

These dimensions include specific indicators, namely: "establishing inclusive values" and "building community"; "orchestrating learning" and "building curricula for all"; "building schools for all" and "organizing support for diversity". Figure 1 summarizes these elements.

Figura 1 – Indicators of the dimensions of the Index for Inclusion



Source: Booth and Ainscow (2011), adapted by the researchers.

In the field of Special Education from the Perspective of Inclusive Education, we highlight Mantoan (2003) and Rodrigues (2006), whose contributions support our analysis of inclusive practices in Higher Education. Recent studies also address SES and Mathematics teaching, including Evaristo, Asnis and Cardoso (2022) and Santiago, Nascimento and Teixeira (2022).

Mantoan (2003) advocates for the development of an inclusive school based on the democratization of education and the elimination of exclusionary practices. As for our study topic, for the author, the implementation of inclusion requires pedagogical reorganization, teacher education, and collaborative practices. In this context, education must embrace students' differences and view them as strengths.

Rodrigues (2006) argues that Inclusive Education requires developing policies, cultures, and practices that value student participation. According to the author, promoting inclusion means offering high-quality services, not just expanding access without appropriate conditions.

Evaristo, Asnis and Cardoso (2022) highlight tutoring and collaborative work as accessibility strategies in Higher Education, including the production of adapted materials. Santiago, Nascimento and Teixeira (2022) reinforce the role of playful approaches in teaching Mathematics in SES, as well as

the need for teacher education, the use of appropriate resources, and the expansion of research in the field.

3. Methodological procedures

In this study, we conducted qualitative research, specifically field research, with five Specialized Educational Service Teachers at Unespar, affiliated with the Special and Inclusive Education Centers (SIECs) and who, consequently, support students in Special Education. We limited our study to these five *campi*, which offer Mathematics teaching degree programs: Apucarana, Campo Mourão, Paranavaí, Paranaguá, and União da Vitória. Data were produced through semi-structured interviews.

For the data analysis, we organized the responses into convergent themes, defined based on the connections between the interviews, the *Index* for Inclusion (Booth; Ainscow, 2011) and the Unespar Joint Normative Instruction (2024). Five convergent themes were identified: "identification of demand", "didactic-pedagogical mediation", "technical-methodological development", "guidance", and "mathematical content". We identified these themes by examining the convergence of approaches across the three documents mentioned here: the interview transcripts, the *Index*, and the Normative Instruction.

We transcribed the interviews using the "Transcribe" feature in *Microsoft Word*, resulting in 40 (forty) pages of data. After reviewing the transcripts, we analyzed the data based on the theoretical frameworks adopted. The analysis was carried out in two stages: first, we read the transcripts in full and identified units of meaning. These units comprise sections related to our research objective, namely, identifying the roles assumed by the SESTs. In the second stage, we grouped these units into the defined convergent themes.

We believe that linking the empirical data to the theoretical frameworks in this study made it possible to understand the responsibilities of SESTs in the context investigated.

4. Professiographic characterization of research participants

The five research participants are SESTs who work at SIECs on 5 (five) Unespar *campi* and serve undergraduate Mathematics students. Table 2 shows the main characteristics of their education and professional experience at their respective *campi*; each has a workload of 20 (twenty) class hours per week.

To preserve anonymity and improve flow, we use fictitious names inspired by people with disabilities. The participants are identified as: Maria da Penha Maria Fernandes, a paraplegic pharmacist; Kátia Garcia Oliveira, a blind singer; Herbert Viana, a paraplegic singer; Terezinha Guilhermina, a blind Paralympic sprinter; and José Carlos Martins, a conductor with a physical disability. To summarize, we will use references to the surnames: Fernandes (1), Oliveira (2), Viana (3), Guilhermina (4), and Martins (5).

Table 2 – Professiographic profile of research participants

Professiographic profile of research participants:
Identification in the research: Fernandes (1) **Age:** 55-year-old woman **Undergraduate programs:** Pedagogy, Accounting, and Portuguese Language and Literature. **Postgraduate courses:** Sociology, Philosophy, Brazilian Sign Language (Libras) and Portuguese Language, Master's in Sustainable Territorial Development, and Doctorate in Literary Theory. **Experience as a Specialized Educational Service teacher in Higher Education:** 12 years. **Years of experience in the field of Special Education:** 12 years. **Professional experience in the field of Education:** Brazilian Sign Language (Libras) interpreter, teacher in the early and final years of Elementary School, High School teacher, Libras interpreter in High School, and Higher Education lecturer.
textbfIdentification in the research: Oliveira (2) **Age:** 36-year-old woman. **Undergraduate programs:** Pedagogy and Occupational Therapy. **Postgraduate courses completed:** Inclusive Special Education; Psychopedagogy; Master's and Doctorate in Education. **Experience as a Specialized Educational Service teacher in Higher Education:** 1 year and 9 months. **Years of experience in the field of Special Education:** 14 years. **Professional experience in the field of Education:** Teacher of Specialized Educational Service in Basic Education, School Counseling, Special Education in the Multifunctional Resource Room, at APAE (Association of Parents and Friends of People with Disabilities), and in Postgraduate and Undergraduate Education.
textbfIdentification in the research: Viana (3) **Age:** 35-year-old man. **Undergraduate program:** Pedagogy **Postgraduate courses completed:** Specialization in Inclusive Special Education and Specialized Educational Service. **Experience as a Specialized Educational Service teacher in Higher Education:** 6 years. **Years of experience in the field of Special Education:** 19 years. **Professional experience in the field of Education:** Teacher of Early Childhood Education, Elementary School (Early and Later Years), High School, Undergraduate, Graduate, Master's and Doctoral Programs, Postdoctoral Supervision, and Special Education, Youth and Adult Education, Teaching Supervisor, Education Specialist, Pedagogical Coordinator, Education Department Technician, Advisor to the Ministry of Education, Department of Higher Education, and Department of Basic and Technical and Technological Education.
textbfIdentification in the research: Guilhermina (4) **Age:** 34-year-old woman. **Undergraduate programs:** Physical Education and Pedagogy. **Postgraduate courses completed:** Specialization in Special Education, Master's and Doctorate in Physical Education. **Experience as a Specialized Educational Service teacher in Higher Education:** 1 year and 9 months. **Years of experience in the field of Special Education:** 13 years. **Professional experience in the field of Education:** Teacher at APAE (Association of Parents and Friends of People with Disabilities), in Basic Education, in High School with students with specific educational needs, in educational management, and as an educational coordinator.
textbfIdentification in the research: Martins (5) **Age:** 30-year-old man. **Undergraduate programs:** Portuguese-English Language and Literature, Pedagogy, and Brazilian Sign Language (Libras) and Literature. **Postgraduate courses completed:** Specialization in Inclusive Special Education and Portuguese Language and Literature Methodology. **Experience as a Specialized Educational Service teacher in Higher Education:** 1 year and 6 months. **Years of experience in the field of Special Education:** 4 years. **Professional experience in the field of Education:** Early Childhood Education, Elementary School (Early and Later Years), High School, and *Lato Sensu* Postgraduate Education. Also in Multifunctional Resource Rooms.

Source: Researchers' archive, 2024.

In summary, the participants mostly have initial education in Pedagogy and *lato sensu* specialization in SES. In terms of professional experience, the participants have diverse backgrounds in Basic Education, Higher Education, Special Education, educational management, and work in settings such as APAE (Association of Parents and Friends of People with Disabilities) and Multifunctional Resource Rooms.

Regarding the students served, we identified varied specific educational needs, highlighting the heterogeneity of the population served by the SESTs. In Table 3, we summarize these specificities.

Table 3 – Characteristics of students supported by Unespar's SESTs

SEST	Specific educational needs
Fernandes (1)	Low vision; deafblindness; ADHD; dyslexia; ASD; deafness; high abilities/giftedness.
Oliveira (2)	Dyslexia; ADHD; low vision; neurodivergence.
Viana (3)	ASD; ADHD; dyslexia; deafness; blindness; intellectual disability.
Guilhermina (4)	ASD.
Martins (5)	Dyslexia; ADHD.

Source: Researchers' archive, 2024.

Regarding the convergent themes, we organized the analysis into five themes. Table 4 lists the convergent themes, "identification of demand", "didactic-pedagogical mediation", "technical-methodological development", "guidance", and "mathematical content", along with the units of meaning that gave rise to them. These units correspond to the responses of five SESTs that converge on the convergent themes. In other words, when Fernandes (1) refers to the convergent theme "identification of demands" once, we indicate this reference as CT1F1, meaning Convergent Theme 1 and Fernandes (1). If Fernandes (1) refers to the same convergent theme more than once, the references are indicated as identified in the interviews, for example, CT2F1, CT2F2, and so on. Table 4 therefore presents the five convergent themes, units of meaning, and representative excerpts for illustration.

Table 4 – Convergent themes, units, and excerpts of convergent themes

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Convergent themes	Units	Excerpts from convergent themes
Identification of demands	CT2F1; CT2O2; CT3O2; CT4O2; CT5O2; CT1V3; CT2V3; CT4V3; CT5V3; CT6V3; CT7V3; CT8V3; CT9V3; CT10V3; CT11V3; CT12V3; CT13V3; CT14V3; CT1G4; CT2G4; CT4G4; CT5G4; CT6G4; CT7G4; CTG4; CT9G4; CT1P5; CT2M5; CT3M5; CT4M5; CT5M5; CT7M5; CT8M5; CT9M5.	CT1F1 "[...] we schedule a meeting, look, we'll explain, a student is coming [...]"; CT1O2 "[...] the welcoming of the student, the reception of this student. From the entrance exam, this student is mapped"; CT3V3 "[...] the teacher will tell me about these specific details"; CT3G4 "The teachers came to talk to me when he [student with autism] was already about to fail"; CT6M5 "The [students] that we also invite to talk, to see how they're doing with the course requirements, they show up, they respond, they come to the meetings.".
Didactic-pedagogical mediation	CT3F1; CT6O2; CT15V3; CT16V3; CT17V3; CT18V3; CT19V3; CT20V3; CT21V3; CT23V3; CT24V3; CT25V3; CT10G4; CT11G4; CT12G4; CT13G4; CT14G4; CT16G4; CT17G4; CT18G4; CT19G4; CT20G4; CT21G4; CT11M5; CT12M5; CT13M5; CT14M5; CT15M5.	CT3F1 "[...] my daily routine is to build this bridge between teacher and student [...]"; CT7O2 "[...] ensuring individualized support for the student [...]"; CT22V3 "[...] I have the knowing of the methodologies [...]"; CT15G4 "[...] because they [teachers of the curriculum components] don't have that pedagogical vision [...]"; CT10M5 "[...] I do all this mediation [student-coordination-teachers].".
Technical-methodological development	CT4F1; CT5F1; CT6F1; CT7F1; CT8F1; CT9F1; CT10F1; CT11F1; CT12F1; CT9O2; CT10O2; CT11O2; CT26V3; CT27V3; CT29V3; CT30V3; CT31V3; CT32V3; CT33V3; CT34V3; CT35V3; CT36V3; CT37V3; CT38V3; CT39V3; CT40V3; CT23G4; CT24G4; CT25G4; CT26G4; CT27G4; CT16M5; CT18M5; CT19M5; CT20M5; CT21M5; CT22M5; CT23M5; CT24M5; CT25M5; CT26M5; CT27M5; CT28M5; CT29M5; CT30M5; CT31M5.	CT5F1 "[...] we ask him [the teacher] to send it beforehand so that he [the student] can study it in advance [...]"; CT8O2 "[...] some students need minor adaptations, for example, extra time, an individual room, an oral test instead of a written test"; CT28V3 "[...] our interventions have been aimed at making the content easier, at understanding the content, and at searching for keywords"; CT22G4 "[...] but what is the teacher's class like? Is he making a mind map on the board, making associations, providing a summary?"; CT17M5 "[...] after that, once the entire form is completed and the IEP is approved by the board, I continue to provide support to them individually.".

Table 4 – Convergent themes, units, and excerpts of convergent themes

(conclusão)

Convergent themes	Units	Excerpts from convergent themes
Guidance	CT13F1; CT13O2; CT14O2; CT15O2; CT16O2; CT17O2; CT18O2; CT19O2; CT20O2; CT21O2; CT22O2; CT41V3; CT42V3; CT44V3; CT29G4; CT32M5; CT33M5; CT34M5; CT36M5.	CT7F1 "[...] provides options for materials, asks the teacher to provide the teaching materials a day in advance so that this student can follow the class. We work with enlarged versions of texts and slides, so I ask them to send them to me and I try to enlarge them to pass on to the students"; CT12O2 "We use our room here at SIEC, the inclusive education center. And we'll do the others with the teacher himself"; CT43V3 "[...] meanwhile, our interventions have been aimed at making the content easier, at understanding the content, searching for keywords [...]"; CT28G4 "[...] raise awareness among all programs, committees, and coordinators"; CT35M5 "[...] it's more of a task of organizing the studies [...]".
Mathematical content	CT14F1; CT15F1; CT16F1; CT17F1; CT18F1; CT19F1; CT20F1; CT23O2; CT24O2; CT25O2; CT45V3; CT46V3; CT47V3; CT48V3; CT49V3; CT50V3; CT51V3; CT52V3; CT53V3; CT54V3; CT55V3; CT57V3; CT58V3; CT59V3; CT60V3; CT61V3; CT62V3; CT63V3; CT64V3; CT30G4; CT31G4; CT32G4; CT33G4; CT34G4; CT35G4; CT36G4; CT37G4; CT38G4; CT39G4; CT40G4; CT41G4; CT43G4; CT37M5; CT39M5; CT40M5; CT41M5; CT42M5; CT43M5; CT44M5; CT45M5; CT46M5; CT47M5; CT48M5; CT49M5; CT50M5; CT51M5; CT52M5.	CT14F1 "[...] we're not qualified to teach a class like that [...]"; CT25O2 "[...] but as for Mathematics, I only know that they [students with special educational needs] haven't come yet because of this fear, this stigma, of being accompanied by a support unit [...]"; CT56V3 "[...] I have a collaborative job, collaborative teaching, because the lead teacher is really the one who teaches [...]"; CT42G4 "[...] they [students with special educational needs] talk more about the issue of understanding content that they consider more complex, so we step in directly, giving tips to the teacher [...]"; CT38M5 "[...] but I won't know, for example, how to explain even a specific topic, a specific theory, no matter how much I read about it, but it's not my area of expertise [...]".

Source: Researchers' archive, 2025.

To expand our studies beyond specific Unespar documents (2024), such as the Joint Normative Instruction, we conducted a parallel study using the *Index* for Inclusion (Booth; Ainscow, 2011), given that this document guides inclusive practices in schools. The authors describe it as "[...] a set of materials to support the self-review of all aspects of a school [...]" (p. 9).

In this regard, we believe that the Joint Normative Instruction provides a counterpoint for the analysis of the responses of Unespar's SESTs, considering the main aspects of Special Education from

the Perspective of Inclusive Education, which, according to the *Index*, are: "creating inclusive cultures"; "developing inclusive practices"; and "producing inclusive policies".

Based on these considerations, we present the responses of SESTs regarding their responsibilities, especially in light of the dimensions of the *Index* for Inclusion (Booth; Ainscow, 2011): "creating inclusive cultures"; "developing inclusive practices"; and "producing inclusive policies", as we believe that these dimensions guide the work of SESTs at Unespar. Studying these dimensions made it possible to understand Special Education from the Perspective of Inclusive Education as a guide for SESTs' practices.

Based on these dimensions and the interview content, we discuss how these professionals work at Unespar, especially regarding their duties with students in the Mathematics teaching degree program and with instructors of curriculum components in this field. Below, we provide a brief description of each of the interviewees in relation to the dimensions of the *Index* for Inclusion.

4.1 Fernandes (1) (55-year-old woman)

When analyzing the responses related to the "creating inclusive cultures" dimension, we observed that Fernandes (1) refers to the everyday practices of mediation between teachers and students, requesting, for example, extensions of deadlines and the provision of adapted materials. As for the "developing inclusive practices" dimension, we observed that Fernandes (1) works continuously, together with teachers and students, to create didactic-pedagogical strategies, teach research procedures, problematize everyday practices, and adapt materials.

4.2 Oliveira (2) (36-year-old woman)

Regarding the "creating inclusive cultures" dimension, the understanding of the need to welcome, map, and support students with specific educational needs stands out, recognizing their identity and autonomy in Higher Education. These practices help students stay at the institution longer. Regarding the "developing inclusive practices" dimension, Oliveira (2) emphasizes the importance of ensuring support through adaptations and individualized assistance, in addition to the involvement of faculty and students in course committees. Regarding the "producing inclusive policies" dimension, this work is expressed by advocating for the development of inclusive environments.

4.3 Viana (3) (35-year-old man)

In the "creating inclusive cultures" dimension, Viana (3) highlights the need to raise awareness in the school community and to value humanizing education, with a focus on welcoming students and promoting their autonomy. Regarding the "developing inclusive practices" dimension, the interviewee refers to working with students, teachers, and coordinators, including adaptations, follow-ups and addressing specific needs. The "producing inclusive policies" dimension is evident from the investigation of demands and the gathering of information.

4.4 Guilhermina (4) (34-year-old woman)

Regarding the "creating inclusive cultures" dimension, the importance stands out of teachers requesting information about students supported by the SIEC team from the beginning of the year, as

well as consolidating a culture of seeking guidance. For the "developing inclusive practices" dimension, actions extend beyond the academic field, including guidance for the university community and monitoring didactic-pedagogical practices for inclusion. In the "producing inclusive policies" dimension, the interviewee notes the need to raise awareness across the entire academic community, with information exchange and collaborative work to address SES demands.

4.5 Martins (5) (30-year-old man)

Regarding the "creating inclusive cultures" dimension, Martins (5) highlights the mapping of demands and holding meetings with teachers and coordinators, emphasizing the need for ongoing professional development. These actions result in the preparation of the IEP. In the "developing inclusive practices" dimension, the monitoring of students, teachers, and coordinators stands out, involving didactic-pedagogical organization, teaching mediation, and guidance on inclusive practices.

Next, we present our discussion of the data.

5. Responsibilities of Specialized Educational Service Teachers in the context of Higher Education

Decree n.º 6.571, of September 17, 2008, provided for Specialized Educational Services (SES) (Brasil, 2008) and defines SES as "[...] a set of activities, accessibility, and pedagogical resources organized institutionally, provided in a complementary or supplementary manner to the education of students in regular education" (Brasil, 2008). Based on this definition, the document lists the objectives of the SES:

> I – Providing conditions for access, participation, and learning in mainstream education for the students referred to [...];
>
> II – Ensuring the transversality of Special Education initiatives within mainstream education;
>
> III – Promoting the development of teaching and learning resources that eliminate barriers in the teaching and learning process; and
>
> IV – Ensuring conditions for the continuity of studies at other levels of education (Brasil, 2008, s.p.).

However, we note that, in Brazil, there are no federal regulations that address the responsibilities of SESTs in Higher Education. In the state of Paraná, the normative document that addresses these responsibilities is Instruction n.º 16/2011-SEED/SUED (Paraná, 2016). At Unespar, these responsibilities are regulated by Joint Normative Instruction n.º 01/2024 PROGESP/PROPEDH/PROGRAD, which sets out procedures for registering the Teaching Activity Plan (ePAD) and characterizes SESTs' responsibilities.

Unespar hired SESTs for the first time in 2022 through a Simplified Selection Process[1] (PSS) (Unespar, 2022). As a result, professionals were hired for the Apucarana, Campo Mourão, Curitiba I and II, Paranavaí, and União da Vitória *campi*. From 2022 to 2025, Unespar had no public tender for SESTs, which directly affects these professionals' work. This reality implies the continuous resumption of activities, since PSS hiring lasts a maximum of two years.

[1] 3PSS is a form of temporary employment to meet specific needs of the public administration.

Adopting PSS contracts creates numerous problems, such as: discontinuity in support services; the recurring need to assess students' specific needs; holding new meetings with teachers; and reviewing records of services provided and resources used. In addition, we highlight that students and SESTs establish bonds that support the teaching and learning process, and that, with temporary contracts, these bonds are compromised.

From the perspective of the duties of SESTs, the IEP is a fundamental document, as it guides and systematizes the actions of these professionals in Higher Education. Many Brazilian Higher Education institutions have not yet implemented the IEP, nor have they standardized their procedures. Added to this is the difficulty teachers have in understanding the need to adapt didactic-pedagogical practices and materials for students in Special Education.

At Unespar, several regulations guide the work and responsibilities of SESTs: Resolution n.º 007/2016-COU/Unespar, Resolution n.º 021/2022-CEPE/Unespar, and Joint Normative Instruction n.º 01/2024 PROGESP/PROPEDH/PROGRAD. This set of regulations guides inclusive processes and tools within undergraduate and graduate programs.

Considering that Special Education is a national public policy, its mandatory nature is unquestionable. However, among the difficulties mentioned by the teachers and also observed during our work as teaching assistants, the amount of time allocated to didactic-pedagogical planning and the perception of increased workload due to inclusive practices stand out.

Regarding these points, we argue that, according to Resolution n.º 007/2019-COU/Unespar, didactic-pedagogical planning is part of teaching activities. This resolution defines planning as:

> [...] the set of actions that teachers undertake to prepare for classes, such as establishing teaching objectives, selecting and defining teaching content, defining methodological options for teaching, preparing teaching content didactically, selecting and preparing texts and teaching materials, defining forms of learning assessment, preparing and correcting learning assessments, among others necessary for conducting the teaching and learning process (Unespar, 2019).

In addition, the resolution stipulates that the number of hours allocated to planning must be equivalent to the number of hours allocated to undergraduate and graduate classes. From this perspective, Unespar's Institutional Development Plan (2023-2027), in addressing student and Human Rights policies, sets the goal of strengthening educational inclusion practices and promoting pedagogical support in Special Education, including guidance, education, team expansion, and institutional assessment:

> Initial action:
>
> - Providing guidance for undergraduate courses and graduate programs on pedagogical and methodological accessibility.
>
> - Providing guidance on institutional procedures for the Specialized Education Plan (IEP).
>
> Effective action:
>
> - Forming working groups for joint discussion of inclusive procedures and practices.
>
> - Developing complementary activities, mentoring, and/or tutoring for inclusive educational mediation.

> - Expanding the number of teachers and contracted staff to form a multidisciplinary team to provide inclusive education services.
>
> Conclusive action:
>
> - Providing pedagogical service in inclusive education on Unespar *campi*.
>
> - Evaluating inclusive education services on Unespar *campi* (Unespar, 2023).

In light of these regulations, Unespar's SIEC multidisciplinary team advises teachers to use their planning hours to prepare lessons and accessible resources, and their office hours to support individual students. It should be noted that there is no specific document regulating this service at Unespar; however, faculty members must include two class hours for every twenty hours of teaching in their Teaching Activity Plans. We would like to point out that Resolution n.º 021/2022 defines the IEP as:

> [...] a pedagogical resource with an individualized focus on the student, aimed at optimizing the teaching and learning process through the identification and planning of didactic-pedagogical and assessment strategies that seek to promote curriculum accessibility, so that the student can reach their best developmental potential in line with the learning expectations established for the educational profile of UNESPAR courses, taking into account their individual needs and potential (Unespar, 2022, p. 3).

The IEP should be developed collaboratively, involving course coordinators, lecturers of curriculum components, the SIEC team, students, and, when possible, their family members (Unespar, 2022). In addition, Joint Normative Instruction n.º 01/2024 defines SES as:

> [...] pedagogical mediation in Inclusive Special Education that aims to enable access to the curriculum and its components through the planning, development, and evaluation of accessibility resources that eliminate barriers to the effective implementation of the didactic-pedagogical process of teaching and learning for students who need SES, taking into account the specific nature of their potential and needs (Unespar, 2024, p. 2).

Based on these documents, we understand that SESTs plan, develop, and evaluate accessibility resources but are not responsible for teaching subject matter. However, when supporting students, SESTs, curriculum subject teachers, tutors, and students can work collaboratively.

SESTs and tutors can contribute, for example, to time management, study methods, mediating assessment activities, and adapting pedagogical strategies to students' needs. Regarding didactic-pedagogical planning, the SESTs are responsible for:

> Coordinating the pedagogical planning of the SES for each student receiving services, assessing the needs for curriculum flexibility to develop the Individualized Educational Plan (IEP), in collaboration with other members of the SES team, teachers, students and, whenever possible, their family members or legal guardians [...]
>
> Establishing the type of activity (complementary or supplementary), the frequency, and the specificity of monitoring didactic-methodological mediation of teaching-learning in academic classroom activities, internships, after-school pedagogical service, home-based activities, and other academic activities (Unespar, 2024, p. 2).

In summary, the regulations analyzed show that the work of Specialized Educational Service Teachers in Higher Education goes beyond direct mediation with students, encompassing planning, institutional coordination, teacher guidance, and the promotion of pedagogical accessibility. However, implementing these responsibilities still faces challenges related to precarious employment contracts,

the lack of specific national regulations for Higher Education, and the need to strengthen an institutional culture committed to inclusive education. In this context, SESTs' work is strategic for consolidating collaborative practices that promote the retention, participation, and learning of students in Special Education, reaffirming the cross-cutting nature of inclusion in the university setting.

6. Final Considerations

Special Education in Higher Education is an educational approach grounded in the conception of Human Rights and integrates equality and difference as inseparable values. With this understanding, we aimed to characterize the responsibilities of Unespar's SESTs in the Mathematics teaching degree programs.

Based on what is established by the regulatory instruments that define the role/position of SESTs, we correlate the guidelines of the *Index* for Inclusion (Booth; Ainscow, 2011). These normative and theoretical foundations enabled us to discuss SESTs' responsibilities at Unespar. Thus, we analyzed, albeit briefly, the responses from the semi-structured interviews with SESTs based on Special Education from the Perspective of Inclusive Education.

We found that federal, state, and institutional regulations address aspects such as: identifying demands, preparing and implementing the IEP, making the curriculum more flexible, providing didactic-pedagogical monitoring for SIEC teams, establishing partnerships between course coordinators, subject teachers, students and their families, recording students' progress and difficulties, and developing pedagogical resources and assistive technology.

During the interviews, we identified that Unespar's SESTs serve different student profiles, especially those with disabilities, pervasive developmental disorders, and other specific disorders. This highlights the diversity of demands addressed by SIECs and their SESTs.

As a result of our research, we identified that the main duties of the SESTs working at Unespar, specifically regarding the teaching of mathematical content and the convergent themes, are:

a) The identification of demands is present in the regulations and in the responses of the SESTs and includes mapping the students' pedagogical specificities. This process includes collecting diagnostic information, analyzing reports, and understanding needs from enrollment through more advanced stages of the course. This is a continuous procedure that underpins other inclusive pedagogical actions.
b) Didactic-pedagogical mediation is manifested in the organization of strategies and in support for teaching and learning. According to the SESTs interviewed, this mediation takes place through raising teachers' awareness, providing guidance on inclusive methodologies, integrating with coordinators, and supporting the development of inclusive pedagogical practices. Specifically, the teaching of mathematical content is not the responsibility of these SESTs. However, when they face problems in their relationships with teachers, in some cases they must also take on this role, for which they have not been trained.
c) Technical-methodological development is guided by regulations regarding the production of resources, the selection of assistive technologies, and the adaptation of materials. The

responses from the SESTs discuss the organization of teaching routines, the adaptation of mathematical language, the search for specific concepts in Libras and the development of accessible materials. Although they do not teach mathematical content, the SESTs indicate the need to understand this mathematical language to make the content more accessible.

d) As for guidance for the community, the SESTs work with managers, coordinators, teachers, students, and families, participating in assessments and contributing to the development of more appropriate practices. The sharing of inclusive methodologies and the follow-up of complex cases are particularly noteworthy.

When considering the *Index* for Inclusion (Booth; Ainscow, 2011), in the dimensions "creating inclusive cultures", "developing inclusive practices" and "producing inclusive policies", we believe that these constitute a relevant reference for the implementation of the National Policy on Special Education from the Perspective of Inclusive Education. At Unespar, this policy is implemented through the dimensions identified in the SESTs' responses: "identification of demand", "didactic-pedagogical mediation", "technical-methodological development" and "guidance".

Regarding the teaching of mathematical content, the interviews indicated that these professionals are not assigned to teach subject-specific content. Their work focuses on mediating teaching and learning involving resources, strategies, and assistive technologies systematized in the IEP. This document monitors the teaching process for the students served and guides teachers' actions.

In addition, the duties of SESTs are strained by the specific nature of Mathematics, which is characterized by a high level of abstraction and its own language. This requires these professionals to have a minimal understanding of that language in order to identify barriers and support the students they serve.

Finally, we understand that it is up to the subject teachers to join the SIEC teams, seek training in Special Education, ask the SESTs for guidance on appropriate resources and didactic-pedagogical materials, assist students at specific times and use didactic-pedagogical planning to prepare their classes with a focus on the educational needs of students in Special Education. While these actions benefit all students, for those with these needs they are essential and a minimum requirement for quality learning.

The results of this study indicate the need to expand research on these professionals' performance in Higher Education, especially in this area. Furthermore, the data underscore the need to strengthen institutional policies to ensure stable working conditions and guarantee the continuity of SEST actions. The study contributes to Mathematics Education by highlighting how inclusive pedagogical mediation influences the teaching and learning of mathematical content in Higher Education.

Finally, we believe SESTs play an essential role in connecting teachers, students, and mathematical content; promoting inclusive methodologies; guiding adaptations; and monitoring assessment processes. In short, they help create institutional, pedagogical, and methodological conditions that ensure access, retention, and learning with equity.

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