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The curricular component “Inclusive Education” in initial teacher education: A case study in a teaching degree in mathematics

El componente curricular “Educación Inclusiva” en la formación inicial docente: Un estudio de caso en un curso de grado en matemáticas

La composante curriculaire “Education inclusive” dans la formation initiale des enseignants : une étude de cas dans un cursus de Licence en Mathématiques

O componente curricular “Educação Inclusiva” na formação inicial de professores: Um estudo de caso em um curso de licenciatura em matemática

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Abstract

The work discusses the contributions of the “Inclusive Education” curriculum component in the initial education of mathematics teachers. It is characterized as a case study with a qualitative approach, whose data were collected from undergraduates and graduates from a mathematics degree course at the Federal Institute of Ceará (IFCE) attending the component from 2016 to 2019. Relevant perspectives were highlighted from participants' views on the curriculum component, highlighting a better understanding of the concept of disability, types, and education from an inclusive perspective, in addition to a greater understanding of the need for initial/continuing teacher education to promote inclusion, favoring didactic-pedagogical adjustments necessary for the effective learning of people with disabilities. The emphasis on the importance of the “Inclusive Education” curriculum component allows us to infer that it

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aroused interest and instigated the search for subsidies that favor a professional practice that promotes learning in diversity.

Keywords: Inclusive education. Initial education. Teacher learning.

Resumen

El trabajo discute los aportes del componente curricular “Educación Inclusiva” en la formación inicial de profesores de matemáticas. Se caracteriza como un estudio de caso con enfoque cualitativo, cuyos datos fueron recolectados de estudiantes y graduados de la carrera de matemáticas del Instituto Federal de Ceará (IFCE) que asistieron al componente entre 2016 y 2019. Se destacaron perspectivas relevantes a partir de las opiniones de los participantes en el componente curricular, destacando una mejor comprensión del concepto de discapacidad, tipos y educación desde una perspectiva inclusiva, además de una mayor comprensión de la necesidad de una formación inicial/continua docente para promover la inclusión, favoreciendo los ajustes didáctico-pedagógicos necesarios para el aprendizaje efectivo de las personas con discapacidad. El énfasis en la importancia del componente curricular “Educación Inclusiva” permite inferir que despertó interés e impulsó la búsqueda de subsidios que favorezcan una práctica profesional que promueva el aprendizaje en la diversidad.

Palabras clave: Educación inclusiva. Educación inicial. Aprendizaje docente.

Résumé

O trabalho discute contribuições do componente curricular “Educação Inclusiva” na formação inicial do professor de matemática. Caracteriza-se como um estudo de caso, com abordagem qualitativa, cujos dados foram coletados junto a alunos e egressos de um curso de licenciatura em matemática do Instituto Federal do Ceará (IFCE), que cursaram o componente curricular nos semestres entre 2016 e 2019. Evidenciaram-se perspectivas relevantes na visão dos participantes quanto ao percurso na disciplina, destacando-se melhor compreensão sobre o conceito de deficiência, os tipos de deficiências, assim como sobre educação na ótica inclusiva, além de maior entendimento acerca da necessidade de formação inicial/continuada de professores, visando à promoção de inclusão, favorecendo adequações didático-pedagógicas necessárias à efetivação de aprendizagem de pessoas com deficiência. A ênfase à importância do componente curricular “Educação Inclusiva” permite inferir que a disciplina despertou interesse e instigou a busca por subsídios que favoreçam uma prática profissional capaz de promover aprendizagens na diversidade.

Mots clés: Éducation inclusive. Formation initiale. Enseignement Apprentissage.

Resumo

O trabalho discute contribuições do componente curricular “Educação Inclusiva” na formação inicial do professor de matemática. Caracteriza-se como um estudo de caso, com abordagem qualitativa, cujos dados foram coletados junto a alunos e egressos de um curso de licenciatura em matemática do Instituto Federal do Ceará (IFCE), que cursaram o componente curricular nos semestres entre 2016 e 2019. Evidenciaram-se perspectivas relevantes na visão dos participantes quanto ao percurso na disciplina, destacando-se melhor compreensão sobre o conceito de deficiência, tipos, assim como sobre educação na ótica inclusiva, além de maior entendimento acerca da necessidade de formação inicial/continuada de professores, visando à promoção de inclusão, favorecendo adequações didático-pedagógicas necessárias à efetivação de aprendizagem de pessoas com deficiência. A ênfase à importância do componente curricular “Educação Inclusiva” permite inferir que a disciplina despertou interesse e instigou a busca por subsídios que favoreçam uma prática profissional capaz de promover aprendizagens na diversidade.

Palavras-chave: Educação inclusiva. Formação inicial. Aprendizagem docente.

The curricular component “Inclusive Education” in initial teacher education: A case study in a teaching degree in mathematics

In recent years, much has been discussed about the schooling of people with disabilities (Silveira, Emuno, & Rosa, 2012). Public policies were instituted to ensure the access and permanence of these students, namely the Federal Constitution (1988), the Law of Guidelines and Bases of National Education (1996), National Guidelines for Special Education in Basic Education (2001), the National Policy on Special Education from the Perspective of Inclusive Education (2008), the Brazilian Law for the Inclusion of People with Disabilities - Statute of Persons with Disabilities (2015). These documents deal with the equality of conditions for entry, continuity, and success in the school system, the provision of specialized educational services, initial, and continuing teacher education programs, as well as the defense of the need for teachers with adequate training both to work in Specialized Educational Service (SES) and for the regular classroom.

The SES was created to reduce barriers that hinder the schooling process, and should be organized as a complementary service to the education of students with disabilities and global developmental disorders and for the training of students with high abilities or giftedness in a supplementary way, and should be integrated into the pedagogical proposal of the institution as well as involve the participation of the family (Brasil, 2011).

Working with students –the target audience of special education– has been a challenge due to factors that can interfere with the process of school inclusion, such as teachers’ lack of awareness about inclusion policies, lack of resources offered by the government, lack of support and specialized professionals in the area of special education, and the non-participation of the family (Silveira; Emuno; Rosa, 2012; Silva; Carvalho, 2017).

For this work, the conception defended by Lima (2006) is assumed, emphasizing that inclusive education should not be understood as special education, even if it is inserted in its assumptions.

Teacher education from the perspective of inclusive education is a field that deserves to be investigated, as the role of the teacher is fundamental not only regarding pedagogical work but also regarding the ways of approaching content to develop techniques that imply the learning of students with disabilities.

In this sense, it should be noted that, in the Brazilian educational context, the propositions to the debate on teacher education and the various factors that encompass the profession are increasingly pressing and have become challenging, requiring efforts from scholars and researchers to overcome the current educational problems. Currently,

contemporary society, marked by the dynamics of globalization, has constantly experienced the impacts of socioeconomic policies (Confronting income inequality; Education for all; Support for higher education; Fund for the Maintenance and Development of Basic Education and for the Valorization of Education Professionals, etc.), which end up having repercussions in the context of teaching, giving rise to successive discussions related to teaching and the field of teacher education.

In view of the above, this study was guided by the following questions: What are the contributions of the curriculum component “Inclusive Education” to the education of prospective mathematics teachers? How do undergraduates and graduates of the mathematics teaching degree course feel about the prospect of working with students with disabilities in the future? Does this curriculum component contribute to using appropriate methodologies to educate students with disabilities?

Based on these problematizations, the study was developed to discuss the contributions of the curriculum component in the initial education of mathematics teachers. The theoretical reflections take as a starting point assumptions of the Brazilian educational legislation and research related to inclusive education.

Inclusive education: Some notes in the light of the literature

Based on the assumption that education is a right for all, people with disabilities have the right to enroll in the regular education system, with equal conditions of access and permanence, as recommended by current educational legislation.

For a long time, people with disabilities lived on the margins of society, did not participate in decision-making, were considered disabled, invalid, or even punished by the gods. However, this situation has changed over time, as people with disabilities have been guaranteed rights that must be safeguarded by the same society that has excluded them over time. According to Araújo and Maués (2013, p. 93), “the development of human society has been converting education into an elite good, and, later, into a claim of the urban middle class and finally as a necessity for all. Necessity has become a right.”

In Brazil, services for people with disabilities began in the mid-nineteenth century, inspired by experiences from Europe and North America. However, it was only in the twentieth century, more specifically in the late fifties and early sixties, that the inclusion of education for people with disabilities emerged in Brazilian educational policy (Mazzotta, 2011).

In this context, inclusive education emerges as a proposal in which everyone should be seen in the face of their peculiarities and not from the point of view of disability, actively

participating in teaching tasks, freely expressing their opinions, and developing as citizens, respecting their differences. Inclusive education is an educational paradigm “based on the conception of human rights, which combines equality and difference as inseparable values, and which advances towards the idea of formal equity by contextualizing the historical circumstances of the production of exclusion inside and outside school” (Brasil, 2008, p. 1).

Special education is a teaching modality that permeates all levels, from basic to higher education. According to the current legislation, students who are the target audience of special education must be enrolled, preferably, in the regular school system and must participate in the specialized educational service (SES), namely, students with disabilities, global developmental disorders, and high abilities or giftedness (Brasil, 2008a).

The SES is a pedagogical support service whose objective is to eliminate barriers that hinder the schooling of students with disabilities. It should be carried out primarily in multifunctional resource rooms (MRR) in their school. In case the school does not have these services, students can use them in another school, during after-school hours, in a complementary way for students with disabilities, global developmental disorders, and, in a supplementary way, for those with high abilities or giftedness, not replacing their participation in their regular classrooms.

In these spaces, the use and manipulation of tangible resources is fundamental for all students, regardless of whether they have a disability or not, because thinking about inclusion “is not just alluding to the fact that students have access to the classroom, it is creating opportunities for them to learn and develop with other students in the same environment, always with a view to the school knowledge to be presented” (Borges et al. 2022. p. 410). This service must be part of the school’s pedagogical proposal, be articulated with other public policies, meet these students’ specific needs, and count on the engagement of the family to ensure full access and effective participation (Brasil, 2011).

In the current conjuncture, the discussions related to the schooling of students with disabilities, the way they learn, and the challenges faced by families and schools are, in some way, themes that have aroused the concern of the scientific community for their inclusion, for inclusive pedagogical attitudes and practices, for the discussion of the urgency in teacher education, or for the school community’s conceptions about this process.

The inclusion of students with disabilities in regular schools is a major challenge for educational policy. In this regard, Lima and Laplane (2016) analyzed school access and permanence of students with disabilities in a São Paulo hinterland municipality, finding that

enrollments are concentrated in regular public education but that a portion of those students are served by special education institutions, with significant school dropouts.

The schooling process of students with disabilities requires attitudes and practices of inclusion to ensure their permanence and success. In this sense, the study by Faria et al. (2018), which had the participation of 217 basic education teachers from public schools to verify knowledge about autism spectrum disorders (ASD), attitudes, and pedagogical practices developed with students with the disorder, showed that most professionals correctly recognize the existence of factors associated with deficits in social interaction, behavior, and communication. However, there are still those who make mistakes in the understanding of etiological factors, indicating “the need for a greater approximation between the knowledge of pedagogical practices for children with ASD in the school environment and their actual execution” (Faria et al., 2018).

From the perspective of knowing the needs of teachers regarding pedagogical work with students with disabilities, Favoretto and Lamônica (2014) conducted a study with the participation of 38 kindergarten teachers from a municipal public school system in São Paulo hinterland, observing that school inclusion is growing, however, teachers still lack knowledge on the subject. In this sense, Camargo and Sant’ana (2015) warn that teachers are fundamental not only for the development of the syllabus but also regarding the ways of approaching these contents to use techniques that imply the learning of students with disabilities.

In the Brazilian educational context, the propositions to the debate on teacher education and the various factors encompassing the profession are increasingly pressing and have become challenging, requiring efforts from scholars and researchers to minimize the current educational problems.

Inclusive education: Some notes in the light of the literature

This research was developed within the scope of the Interdisciplinary Research Group on Teaching and Learning (GIPEA) of the Federal Institute of Education, Science and Technology of Ceará - IFCE *campus* Cedro. It adopted a qualitative approach, whose main characteristic is the fact that it is comprehensive or interpretive, as it “considers the researcher’s conception of the world, its subjectivity, and seeks to understand phenomena experienced by the subjects, thus considering their interpretation of the object studied” (Polak & Diniz, 2011, p. 71). The study had the natural environment as the direct source of data and the researcher as the key instrument, characterized as descriptive because it is concerned with the process and not only with the result and the product. Furthermore, the data tend to be inductively analyzed

since the meanings the subjects attribute to the phenomena are essential for the research (Bogdan & Biklen, 1994).

The research is configured as a case study, a strategy that, because it is an “empirical investigation, investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly defined” (Yin, 2001, p. 32). For Triviños (2010), it consists of a type of qualitative research that takes as its object a unit analyzed in its breadth and complexity.

Data were collected using an electronic questionnaire created through Google Forms, elaborated based on the research objectives. This data collection instrument allows for the collection of information about knowledge, beliefs, feelings, values, interests, and expectations (Gil, 2008).

The research subjects were students and graduates of the mathematics teaching degree course attending “Inclusive Education” in the academic period from 2016 to 2019. The questionnaire was sent by e-mail to 57 participants, according to a survey of e-mail addresses carried out through the Q-Academic Web System on the <https://qacademico.ifce.edu.br/qacademico/index.asp?t=1000> website through the professor’s login (first author of the study), following all legal procedures of ethics in the research. Of the contacted, 37 responded.

The questionnaire comprised eleven objective questions related to gender, age group, period of course of the curriculum component, identification of the participant as a course student or graduate, and the exercise or not of teaching at the time of the research. Five subjective questions were also part of the instrument, seeking to identify whether the student or graduate, after having attended the curriculum component “Inclusive Education,” considered to have developed the ability to know and reflect on methodologies and materials to support diversified teaching, as mentioned in the pedagogical project of the course.

The information that served to characterize the research sample is described in Graph 1. The participants were identified with AL (initial letters of the word student), followed by a natural number (AL01, AL02, AL03, ..., AL37), to have their identities preserved during the analysis.

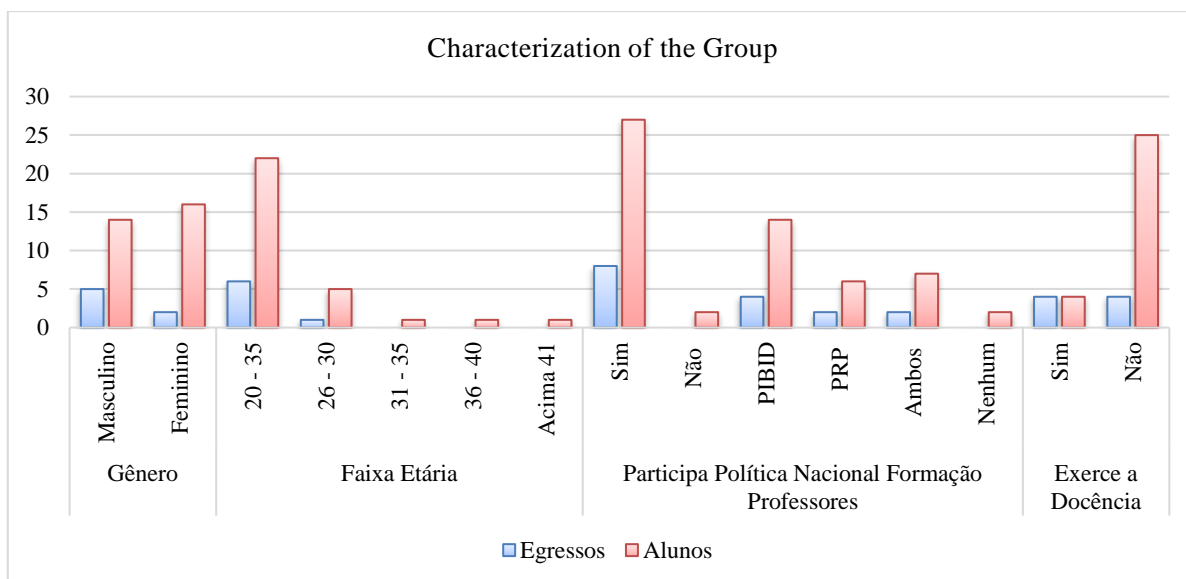


Figure 1

Characterization of the group in terms of gender, age group, situation in the course, participation in any action of the national policy of teacher education, such as the Institutional Program of Scholarships for Initiation to Teaching or Pedagogical Residency Program and teaching practice (Authors, 2023)

We based our analysis on the theory proposed by Bardin (2009) of content analysis and followed these steps: 1) pre-analysis, 2) exploration of the material, and 3) treatment of the results, inference, and interpretation. Initially, we did float readings to observe the participants' contributions. After the pre-analysis, the material was organized into synthesis tables, allowing the definition of themes that could be understood, according to Bardin (2009, p.105), as units of meaning that are “naturally freed from a text analyzed according to criteria related to the theory that serves as a guide to reading.”

During the exploration of the material, exhaustive readings of all the answers to the questionnaire were carried out so that, finally, the treatment of the data found could be proposed, interpreting them in a subjective but systematic way. Thus, we sought to build inferences, considering the objectives proposed in the research, defining the axes of analysis that, from the perspective of Bardin (2009), should be pertinent and objective, reflecting the researcher's intentions and are conducive to the objectives he intended.

Perceptions of undergraduates and graduates regarding the contributions of the Inclusive Education curriculum component in a mathematics teaching degree course

Becoming a mathematics teacher does not happen overnight. It is a continuous and lengthy process influenced by several socio-historical factors (Caporale; Nacarato, 2018). Based on this assumption, discussing the contributions of the curriculum component “Inclusive Education” in the initial education of mathematics teachers is indispensable in teacher education from the perspective of inclusive education, admitting prospective teachers as subjects in constant constitution.

In this section, we present the analyses of the collected data, seeking to respond to the objective already announced, i.e., to reflect on the contributions of the curriculum component “Inclusive Education” in the initial education of the mathematics teacher, observing the legislation on the National Policy on Special Education from the perspective of inclusive education, given the contributions of such component in the light of the theoretical framework on inclusive education.

In the context of the mathematics teaching degree course at IFCE Cedro campus, “Inclusive Education” is an elective subject with a workload of 40 hours/year, presenting as a syllabus the study of “different human disabilities and methodological approaches for the education of students with disabilities” and aims to “understand, discuss and analyze the education of people with disabilities in the context of inclusion” (IFCE, 2012, p.136).

The process of organizing the data resulted in the grouping of expressive excerpts presented from each question, which led to the organization of three tables with the following structure: Difficulties in dealing with students with disabilities; Relevant aspects during the course (exposition of content, practical activities); and Contributions of the curriculum component “Inclusive Education” to initial teacher education.

Figure 1 presents the thematic axes identified in the participants’ answers about the difficulties encountered in dealing with students with disabilities in the context of regular schools.

Table 1.

Difficulties in dealing with students with disabilities (Authors, 2023).

Thematic Axes	Excerpts from the speeches	Participants
Communication	The right way to undertake communication; How to develop activities capable of meeting the desires of reality; Way of communication. Work on the activities and contents of the curriculum through the deficiency in communication; Communication with deaf people; I didn't know how to communicate.	AL01; AL04; AL08; AL10; AL11; AL13.
Appropriate methodologies for the promotion of interaction and effective learning	Promote inclusion in the classroom and thus make their learning effective. Another difficulty faced was recognizing what their previous knowledge was, which methodology would best meet their needs, and also how to carry out their learning assessment; Lack of preparation with regard to the act of including activities that would reach all students; To make the student understand the content of the course; Because it was the first contact and I didn't know how to work with the student, it was a great difficulty, I also didn't know how to pass on methodologies that could help him develop, because he was a student with autism; To what extent I could interact with students, what were their limitations; To be able to make the adapted lessons effective and reach the students; Deal with the lack of concentration, try a way to explain the content in a way that the student understands; Adapt the content to students' needs; What methodology to use to include that student in the activities proposed in the classroom.	AL05; AL06; AL09; AL11; AL14; AL16; AL17; AL18; AL20
Student behavior	I talked a lot, made noises, didn't pay attention in class, and didn't do activities; Regarding his behavior, perhaps the school and the family, not knowing how to deal with the situation, allowed him to do only what he wanted at his own pace, causing a bad habit in the student who barely stopped in the classroom and did not participate in the proposed activities.	AL02; AL07
Working conditions	Pedagogical material that was not available for her; How it provides adequate teaching in the face of the institution's structure	AL12; AL15

From the participants' answers, we observed that the main difficulties are communication, lack of knowledge about appropriate methodologies to promote interaction and effective learning, students' behavior, and working conditions.

Concerning communication, the teaching work is done through interaction with the other. In this sense, interviewees expressed their limitations, especially regarding the possibility of communicating with deaf people (AL01, AL04, AL08, AL10, AL11, and AL13).

Despite having attended the discipline of Brazilian Sign Language – LIBRAS, with a workload of 40 hours/y, we can infer that the study participants, even having completed the subject, demonstrated that they knew little or did not master LIBRAS. This problem implies in the process of inclusion and schooling of students with special educational needs (Faria et al., 2018).

This data points to the urgency of discussing the need to expand the workload of the curriculum component. In this sense, the dialogue between the course Collegiate and the Structuring Teaching Nucleus (NDE) is presented as a path, considering that both are part of the organizational, didactic, and pedagogical structure and can contribute to the monitoring, consolidation, and continuous updating of the Pedagogical Project of the Course.

For Bakhtin (2010), language is an essential communication system that implies human development. In this way, communication is a process of expressing oneself in relation to the other and not simply to the other, taken as the materialization, the concrete realization of verbal/discursive interaction (Molon & Viana, 2012).

Regarding the teaching methodologies focused on the promotion of interaction and effective learning, we observed that undergraduate and graduate students (AL05, AL06, AL09, AL11, AL14, AL16, AL17, AL18, and AL20) showed concerns about the teaching and learning processes of students with disabilities, especially regarding previous knowledge, methodological strategies to better meet the specificities of students, in addition to learning assessment. Participants' concerns corroborate the considerations of Carmo et al. (2020) when they suggest an existing disarticulation between public policies for the inclusion of students with disabilities and teacher education processes to serve them, the latter remaining a secondary concern for school inclusion.

In addition, the participants are apprehensive about the lack of preparation for the inclusion process, considering the different specific educational needs, and for the adequacy of work strategies to students' needs, enabling the development of a pedagogical practice capable of enabling student learning.

The feeling of powerlessness toward the inclusion process reflects aspects of the Brazilian educational context in which, according to Siems (2010), there is a recent concern with teacher education focused on inclusive education. He believes more investments are needed to (re)build educational practices, (re)orienting processes and formative contexts for teaching performance.

The Teaching Degree in Mathematics (2012) Political Pedagogical Project (PPP) indicates that the subject “Inclusive Education” should offer theoretical classes (expository-

dialogued), technical visits to schools that work on inclusion, and visits by people with disabilities and family members to the classroom for dialogues and experiences.

As for the respondents' experience in the Supervised Practicum, Institutional Scholarship Program for Initiation to Teaching (PIBID), or Pedagogical Residency Program (PRP), at some point, undergraduates and graduates came across a student with disabilities. Regarding these students' behavior, the research participants revealed some tension in the face of the situation, which, in the context of the lived experience, it seems, was recurrent. Indeed, restlessness and excessive chattering among students with disabilities in the classroom tend to make it difficult for them to carry out their work in terms of learning. However, we must realize that this behavior may be inherent to the student's disability.

We also observed that participants understand that the school and the family must interact to find alternatives that help teaching and learning. Another concern is teachers' (AL12 and AL15) working conditions –some institutions may have precarious or inadequate physical structures, and didactic pedagogical material may be unavailable.

Given the interviewees' concerns, we must admit that although the Brazilian educational context has defined public policies and created legal instruments that explicitly allow for building a society for all, much must still be done for school inclusion. Thus, effective actions should be promoted based on work and experiences with students with some disability, considering the legal prerogatives in force.

Based on this context, the following topic will focus on the aspects that most caught the attention of undergraduates and graduates in the "Inclusive Education" component (content exposition, practical activities).

Table 2

Relevant aspects during the “Inclusive Education” curriculum component (Authors, 2023).

Thematic axes	Excerpts from the speeches	Participants
Difficulties in dealing with students with disabilities	The difficulty of working with students who have some type of disability and of including them in all contexts; (...) Even after such a long time, we still face so much difficulty in dealing with students who have specific educational needs; Know how to deal with students; The complexity of being able to help students; Realize that no matter how much we study and delve into this subject, we are never 100% prepared to deal with it.	AL01; AL02; AL03; AL17, AL21; AL24; AL31
Importance of the curricular component and the subjects/themes addressed	(...) it should be a mandatory subject in the course because it is a topic of extreme importance in society; important issues for our formation; The possibility of studying about the various types of disabilities; The various methodological possibilities to include students with disabilities; The different types of disabilities; (...) notions of Braille that we received in the course; All the activities developed (theoretical and practical) and lived experiences had a considerable value.	AL04; AL07; AL11; AL12; AL13; AL18; AL20; AL27; AL31; AL36.
Training and performance of the teaching teacher	The fact that the teacher was deaf did not hinder the learning of the subject; The domain of the teacher to whom the subject was taught; How important it is that there are trained professionals in this area and how important it is that teachers have this training in their undergraduate studies.	AL16; AL 33; AL 37.
Methodologies used, practical activities, and use of concrete materials	(...) Braille workshop that took place, in which the lecturer was visually impaired; The methodology diversified by the teacher; Practical activities, where graduates had to design classes aimed exclusively at students with disabilities; The study of visual impairment; The form of exposition on the content; The papers presented on disabilities; The way they were worked; presentation of seminars; The Braille machine with its own language; The approach; Concrete materials; technical visits that were able to relate the current world with the challenges encountered	AL05; AL06; AL08; AL09; AL10; AL14; AL15; AL19; AL22; AL23; AL25; AL26; AL28; AL30; AL32; AL34; AL35.

Regarding the experiences lived during the curriculum component, we noted that undergraduates and graduates pointed out difficulties working with students with disabilities. There is a recurrent concern about these students' inclusion in various contexts, as provided for in the legislation, whose right is not limited to ensuring regular enrollment. The complexity of teaching and learning and the need for further in-depth theoretical studies initiated on the occasion of the offer of the curriculum component are highlighted. Acknowledging the

difficulty in promoting inclusion in the classroom and the importance of this study in the initial education course is an advance in the proposed studies.

In this sense, Art. 12 of Resolution CNE/CP No. 2 of December 20, 2019, specifies dimensions of professional teaching competencies and guides the need to address “legal frameworks, knowledge and basic concepts of special education, proposals, and projects for the care of students with disabilities and special needs” (Brasil, 2019, p.7).

Thus, offering the curriculum component is essential to initial teacher education and “should be a mandatory subject” (AL04), as it enables knowledge of the various types of disability and the methodological strategies to promote those students’ inclusion through practical activities, which will enable experiences with the recognition of the potential of this public, and may allow a closeness between theoretical knowledge and the pedagogical practices necessary for teaching. In the perception of De Vitta, De Vitta, and Monteiro (2010, p. 425), for inclusion to occur, the teacher’s way of being and teaching must be coherent. Moreover, they must be sensitive about class diversity and believe there is potential to be explored.

Regarding the professional formation of the teacher teaching the component, the importance of education at the undergraduate and graduate levels is emphasized, considering the mastery of contents and the discussions proposed in the course of the curriculum component, which ensures not only excellence in the theoretical approach but, above all, in the search for strategies that promote the learning of undergraduate and graduate students. as reinforced by AL37, when he indicates “how important it is to have trained professionals in this area and also how important it is for teachers to have this training in their undergraduate studies.”

Students (AL05, AL06, AL08, AL09, AL10, AL14, AL15, AL19, AL22, AL23, AL25, AL26, AL28, AL30, AL32, AL34, and AL35) emphasized the relevance of the diversified methodologies used, the use of concrete materials, the holding of workshops, seminars, and other practical activities as an opportunity to relate theory and practice in initial education. Regarding theory and practice in initial education, Tavares, Santos, and Freitas (2016) warn about the need for a link between them so that the undergraduate student does not feel that one is distant from the other.

The experience with multiple methodological approaches tends to prepare prospective teachers before the challenges of materializing teaching and learning, considering the differences, and ensuring students’ total development. Regarding inclusive practices, Rodrigues (2010, p. 89) points out that getting closer to students to help them with their limitations “is a factor that contributes to their development, this proximity of teachers to

students and the symmetrical dialogue between them is necessary for education and ways to contribute to their inclusion.”

The following are contributions from the curriculum component “Inclusive Education” of the mathematics teaching degree course at IFCE campus Cedro to initial teacher education.

Table 3.

Contributions of the subject “Inclusive Education” to initial teacher education

(Authors, 2023).

Thematic axes	Excerpts from the speeches	Participants
Greater theoretical and professional knowledge	(...) so that we can work with students who have some kind of disability; (...) shows that the teaching of mathematics is more than a transmission, it needs a concrete vision and must be adapted to the needs of each individual; (...) to understand how this type of education works; (...) greater knowledge of the subject; (...) showed better methods for working with students with different types of disabilities; (...) it makes it possible to rethink, review and structure successful practices that can be developed with all types of students; In the diversity present in the school context; (...) know and discuss relevant issues about inclusion; (...) it aroused concerns that certainly drive me to seek a more inclusive teaching practice; It showed that the teacher's role when there is a student with disabilities is to intervene in activities that the student does not yet have the autonomy to develop alone, helping the student to feel capable of performing them and thus make him feel included in the classroom; (...) that there are ways in my power to cope; (...) many ways of working with mathematics in a different way, but in practice I have not yet had this experience; Know that the teacher must be sensitive, seek to know their students, their difficulties and adapt the contents so that they include all teachers in the teaching and learning process.	AL01; AL03; AL05; AL08; AL09; AL11; AL12; AL13; AL16; AL17; AL18; AL19; AL20; AL22; AL25; AL26; AL27; AL28; AL29; AL31; AL32; AL33; AL34; AL35; AL36; AL37
Understand the need for professional teacher education	That every disabled person has the right to inclusion and that all professionals should be prepared so that this inclusion is done effectively; (...) the discipline brought a greater perspective of the need that we as mathematics teachers must adapt to work better with people with disabilities, (...) the Inclusive Education curriculum component opened space for the reflection of an inclusive teaching practice. Inclusion is an ongoing process, as is the training of the mathematics teacher. It is essential that teachers are open to identifying and understanding such deficiencies and thus seek to improve their practice to promote meaningful learning for all students without distinction; Despite studying inclusive education, we know that teachers cannot limit themselves only to the subject of the course but seek to improve themselves and learn about the subject.	AL04; AL06; AL10; AL24
The importance of inclusive education	(...) It is paramount since the school is a place for everyone, and if you do not have training in the area, the exclusion of students with special needs; In a very significant and broad way because today I see that Inclusive Education has made a difference for people with disabilities and that they need extra support, and we, as prepared	AL14; AL15; AL30,

	<p>students, and later teachers, can intensify ourselves for an improvement as well as for the development and contribution of activities and benefits, as well as projects that involve inclusive education as a form of learning and support for those in need; (...) It was fundamental for us to understand that each student has their own particularities. (...) It is fundamental that we, teachers, can minimally understand how to communicate with students with disabilities.</p>	
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We observed that the curriculum component brought students a better understanding of the concept of disability and the types of disability, and education from an inclusive perspective. By expanding the theoretical knowledge, we realized participants were more confident about working with this public. The activities enabled them to develop teaching strategies that adapt to each student's needs, contributing to their professional performance before diverse and unexpected situations and developing greater sensitivity and attention to each student's peculiarities.

From the education perspective, we noticed that the discipline provided a greater understanding of the need for initial and continuing professional teacher education to promote spaces for reflection on practice and, in this way, promote effective inclusion, which favors the didactic-pedagogical adaptations necessary to promote meaningful learning. Although school inclusion is growing and many teachers lack knowledge on the subject (Favoretto & Lamônica, 2014), it is noteworthy that undergraduates and graduates understand the need for professional training to seek better job possibilities, such as mathematics teachers for students with disabilities.

In inclusive education, teachers play a fundamental role in identifying and understanding deficiencies, seeking to improve their practice, and should not be limited only to the course curriculum component, but should fight for formative conditions on the theme, developing teaching strategies that imply the learning of students with disabilities (Camargo & Sant'ana, 2015).

Final Considerations

This study highlighted essential management and planning aspects in educational institutions, not only in teacher education institutions but also in those that serve students with disabilities. Despite the relevance of legislation guarantees, much must be done to make them

effective in practice, which does not imply only providing access but, above all, asserting actual conditions of inclusion and effective learning and construction of citizenship.

The offer of the “Inclusive Education” subject in initial teacher education courses promotes reflections that strengthen prospective teachers’ professional education and the struggle for the rights of students with disabilities by constructing and bridging theoretical and practical knowledge for the exercise of teaching, promoting not only a sensitive look at the context of formal education but also highlighting the role and need for engagement of society, particularly families.

The findings point out that within the scope of the “Inclusive Education” curriculum component, undergraduates and graduates recognize the need to expand formative spaces, whether in initial or continuing teacher education, considering that promoting inclusion goes through theoretical knowledge, which can foster and support effectively inclusive pedagogical practices in the school context, seeking didactic strategies that are close to the real educational needs of this target audience. In addition to offering the curriculum component, we understand it is necessary and possible to promote extension actions to strengthen initial education and promote continuing education, as well as develop research activities in the local contexts of work of in-service and prospective teachers.

From the perspective of the participating students, data suggest precarious working conditions for teachers due to inadequate infrastructure and pedagogical resources to serve students with disabilities. Although the component has enabled contact with concrete strategies and materials that can contribute to improving the teaching-learning process, the reality of the schools is limited to the effectiveness of these strategies, given the unfavorable conditions faced by teachers who work with this public.

The importance of the studies promoted by the curriculum component dialogues with the research participants’ understanding of the complexity of the teaching work and the need for constant training to bring theoretical and practical knowledge closer to the most varied contexts of action. The emphasis on the importance of inclusive education allows us to infer how much the discipline aroused interest and instigated the permanent search for subsidies that favor a professional practice that promotes learning in diversity.

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