

A PERSPECTIVA DOS PROFESSORES DE QUÍMICA E MATEMÁTICA DE UMA UNIVERSIDADE FEDERAL QUANTO À INCLUSÃO EDUCACIONAL DOS ALUNOS COM DEFICIÊNCIA NO ENSINO SUPERIOR

LA PERSPECTIVA DE LOS PROFESORES DE QUÍMICA Y MATEMÁTICAS DE UNA UNIVERSIDAD FEDERAL EN CUANTO A LA INCLUSIÓN EDUCATIVA DE LOS ALUMNOS CON DISCAPACIDAD EN LA ENSEÑANZA SUPERIOR

THE PERSPECTIVE OF TEACHERS OF CHEMISTRY AND MATHEMATICS TEACHERS AT A FEDERAL UNIVERSITY REGARDING THE EDUCACIONAL INCLUSION OF STUDENTS WITH DISABILITIES IN HIGHER EDUCATION

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RESUMO: Por muito tempo, pessoas com deficiência sofreram exclusão na sociedade, em diversas áreas. A partir do século XX, observa-se uma mudança com a criação de políticas educativas no intuito de promover a inclusão escolar. No entanto, ainda nota-se práticas excludentes por parte dos professores no Ensino Superior. Assim, este trabalho objetivou analisar a perspectiva dos professores dos cursos de Licenciatura em Química e Matemática de uma Universidade Federal situada no Sul de Minas Gerais sobre a temática inclusiva. O tipo da pesquisa realizada é o estudo de caso. Efetuou-se uma entrevista semi-estruturada e realizou-se uma Análise de Conteúdo. Constatou-se que há uma defasagem na formação inicial desses professores sobre a perspectiva inclusiva e que existe a necessidade de uma formação continuada sobre o tema devido ao desconhecimento sobre o mesmo, para que assim, seja possível alcançar o ensino-aprendizagem dos graduandos com deficiência.

PALAVRAS-CHAVE: Educação inclusiva. Formação de professores. Inclusão.

RESUMEN: *Por mucho tiempo, las personas con discapacidad han sufrido exclusión en la sociedad, en diversas áreas. A partir del siglo XX, se observa un cambio con la creación de políticas educativas con el fin de promover la inclusión escolar. Sin embargo, todavía se nota prácticas excluyentes por parte de los profesores en la Enseñanza Superior. Así, este trabajo objetivó analizar la perspectiva de los profesores de los cursos de Licenciatura en Química y Matemática de una Universidad Federal situada en el Sur de Minas Gerais sobre la temática inclusiva. El tipo de investigación realizada es el estudio de caso. Se realizó una entrevista semiestructurada y se realizó un Análisis de Contenido. Se constató que hay un desfase en la formación inicial de estos profesores sobre la perspectiva inclusiva y que existe la necesidad de una formación continuada sobre el tema debido al desconocimiento sobre el mismo para que así sea posible alcanzar la enseñanza-aprendizaje de los graduandos con discapacidad.*

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PALABRAS CLAVE: *Educación inclusiva. Formación de profesores. Inclusión.*

ABSTRACT: *For a long time, people with disabilities have been excluded in society in several areas. From the twentieth century, there is a change with the creation of educational policies in order to promote school inclusion. However, it is still noticeable practices by teachers in Higher Education. Thus, this work aimed to analyze the perspective of the professors of the degree courses in Chemistry and Mathematics of a Federal University situated in the South of Minas Gerais on the inclusive theme. The type of research carried out is the case study. A semi-structured interview was conducted and a Content Analysis was conducted. It was found that there is a gap in the initial training of these teachers on the inclusive perspective and that there is a need for continuous training on the subject due to the lack of knowledge about it, so that it is possible to achieve the teaching-learning of the graduates with disabilities.*

KEYWORDS: *Inclusive education. Teacher training. Inclusion.*

Introduction

People with disabilities have long been excluded from society due to prejudice and discrimination. The invisibility resulted from the lack of guarantee of rights in the various areas of human existence - education, health, transportation, work, architectural spaces, among others - that prevented the development of their citizenship (ALMEIDA, 2015). This reality was transformed, especially from the twentieth century, both in the Brazilian and international context.

It is important to understand that this action was due to scientific productions on social and educational inclusion themes. In this regard, Teodoro and Sanches (2006, p. 65), point out that the production of these documents around this issue spurred the creation of educational policies at international level and “revealed the urgency of combating exclusion and the need to be elaborated and made available conditions for the operationalization of social and school inclusion”. This concern has led several countries, such as Denmark, to adopt policies that ensure the rights of persons with disabilities, especially in schools.

Thus, in the international context, education for people with disabilities that includes inclusion called Special Education, began to be questioned from 1959 in Denmark, which added in its legislation the concept of mainstreaming. According Teodoro and Sanches (2006, p. 65), "such actions would be to elaborate living conditions for people with disabilities similar as much as possible to the normal conditions of the society in which they live". For this, its generalization in the educational environment, aimed to trigger the replacement of segregating

practices by integrative practices, thus promoting the process of school integration and the deinstitutionalization of people with disabilities.

In Brazil, the education of people with disabilities was built through the first Law of Guidelines and Bases of National Education (LDB, Portuguese initials) no. 4,024/1961 (BRASIL, 1961) which established the correct orientation of their attendance in the regular education network in order to integrate them in the community. Special Education remained present in the LDB and was reaffirmed in the Federal Constitution of 1988, in particular, in Article 208, which assumes that it is the State's duty to guarantee this specialized educational assistance to people with disabilities in the regular school system (BRASIL, 1988).

In the meantime, it is important to understand that Inclusive Education is the idea that all people should have equal access to the education system. It recognizes diversity and enables the development of empathy, as living with human diversity favors the construction of new relationships and essential experiences in the formation of being and in the development of teachers and students, expanding for them the understanding of the concepts of justice and law (DUARTE *et al.*, 2013). Thus, teaching should be improved to provide satisfactory conditions for each student with disabilities to need for their learning.

It is important to understand that this adaptation should not only occur in Basic Education, but also in Higher Education, in which the entry of students with disabilities is becoming increasingly evident. This fact is due to the choice of an inclusive education system in Brazil that has reached a higher number of enrollments of people with disabilities in higher education institutions. Enrollment rose from 5,078 to 29,034 between 2003 and 2013, a significant advance, according to the Census of the Ministry of Education and the National Institute for Educational Studies and Research Anísio Teixeira (BRASIL, 2013), reaching 33,337 in 2014. And yet 41.1% of enrollments are in federal institutions.

This advance in enrollment articulated with the legislation, has made the Federal Institutions of Higher Education (IFES, Portuguese initials) have the duty to ensure the permanence of people with disabilities in the educational context effectively and equitably in the activities developed within the institution. Regarding this aspect Dechichi, Silva and Gomide (2008, p. 338) point out that “the arrival of these students to undergraduate courses at public universities has revealed the need to provide academic care that helps them build knowledge”.

From this perspective, the Ministry of Education and Culture (MEC), through the Secretariat of Higher Education and the Secretariat of Special Education, implemented, in 2005, the Include Program - Accessibility in Higher Education, which aims to promote the

development of accessibility policies in the IFES. From 2005 to 2011, the Include Program issued edicts “with the purpose of supporting projects for the creation and consolidation of Accessibility Centers, to eliminate physical, pedagogical, communication and information barriers, environments, equipment and teaching materials” (MENDES; ALMEIDA, 2015, p. 274).

However, it is observed that these barriers, especially the attitudinal ones, are still present in universities and need to be eliminated, so that it provides these accessibility conditions and also creates alternatives to avoid exclusionary practices by teachers (CASTRO; ALMEIDA, 2014). It is important to remember that teachers are inserted in this process from the reflection that the public university is not solely responsible for the inclusion process, it is an integral part of the implementation of public policies that guarantee financial support for actions and initiatives in this context. It is worth remembering that IFES have professionals from the most diverse areas of knowledge who can and should contribute to this inclusive teaching, with research and extension in the area of special educational needs, and the science of their responsibility in the classroom with students with disabilities (DUARTE *et al.*, 2013).

In this view, it is important that teachers who teach the subjects offered in undergraduate courses build a systematized knowledge to use appropriate methods, strategies and procedures to ensure the educational inclusion of these subjects. In our view, teachers play this role because, through classroom interaction, they have direct contact with students with disabilities. Thus, they constitute important elements for the realization of inclusive education in the higher education scope.

However, research shows that teachers do not have theoretical and practical knowledge to work with these students in the classroom. The research by Rocha and Miranda (2009) demonstrated the unpreparedness of teachers to meet the specific needs of students with disabilities and the university, due to the lack of material conditions. In this research, through the testimony of a hearing-impaired student, who was studying business administration at a federal university in northeastern Brazil, it was found that technological resources such as multimedia projection were little used by teachers. This made it difficult to follow the classes, because the transmission of the class content by the teacher, without consulting texts or books, or other sources of research on the Internet, was a factor that, in his view, limited his development in the classroom in relation to the content taught.

In the study by Pacheco and Costas (2011), which analyzed the process of inclusion in a higher education institution, this idea was reaffirmed, since at the same time that teachers understood that it was necessary to attend to students with disabilities, they felt without the

preparation and guidance to meet this demand. The same was pointed out by university course coordinators when asked about the main obstacles to inclusion when stating that it is teacher education. There was then a concern about the gap in teacher training to meet academics with special educational needs.

On the other hand, it is considered that for inclusion to be effective, it is necessary to strengthen the teachers' formation in relation to the theme in question to prepare them for this reality. In this sense, it arises from the educational need to broaden the discussions, the investigative processes and the actions on this theme, in order to avoid only integrative teaching.

Tardif (2000) argues that superficiality in teacher education is related to its idealization as an application model of knowledge: students spend years of graduation attending classes based on disciplines and constituted by propositional knowledge. Then, or during graduation, they will intern to "apply" this knowledge. When the training is over, they begin to work on their own, learning their craft in practice, and most often find that this propositional knowledge does not effectively apply to everyday action.

Therefore, the knowledge built during training constitutes a false representation of the professionals' knowledge about their practice. The same author also points out that professional knowledge requires a portion of improvisation and adaptation to new and unique situations that require professional reflection and prudence in order to solve the problems encountered by him. These are evolutionary and gradual, and require continuous and continuing training. Professionals should thus self-train and requalify themselves through different courses after their initial university studies.

Tardif (2014) also states that teacher education goes beyond academic and professional knowledge, since it involves personal knowledge (family, life history), others coming from previous school education (primary, secondary school, etc.), others related to vocational training (in higher education institutions, among others) and knowledge originated from their own experience in the profession in the classroom and school (practice of the craft).

Therefore, it is clear that teacher education is continuous as it extends throughout your professional career. This justifies the importance of initial training that significantly contemplates the inclusive perspective, and especially of continuing education, because this is where there is the development of knowledge that has not been explored. These are based on a reflective posture of the teacher, when faced with the reality of inclusive teaching in his daily work, which enables him to advance by his role of provoker, generator of studies and creator of new proposals for action inside and outside the institution. It is also important to remember that it is in the work experience that their own professional knowledge is produced that

privileges inclusive teaching strategies for students with disabilities, to face the challenges of an inclusive teaching, that minimizes the barriers they encounter in the classroom and in their learning process.

In short, the work experience, therefore, is a space where the teacher applies and elaborates new knowledge. It can, for example, acquire a reflective posture, resume and reproduce what was learned in undergraduate, that is, reiteration of what is known in what is known to do. Thus, teachers who seek continuing education, improve their work with their own daily experiences and seek to break the obstacles encountered in this way through the constant search for knowledge about inclusive education and can provide an equitable learning for all.

And from the focus on the need for inclusive education, attention is drawn to science teaching, which is fundamental for all people, as it enables the individual to develop a critical view of the reality in which they live. And that, in addition, can use the knowledge acquired in science in their daily lives, analyze different situations and be able to evaluate issues in order to contribute positively in society and promote its progress (RIBEIRO; BENITE, 2010).

Given this scenario, this research has as context the Federal University located in the south of Minas Gerais since it is necessary to reflect on the individuals responsible for including, that is, the teaching teachers. Therefore, this research aims to analyze the perspective of the professors of the undergraduate Chemistry and Mathematics courses of this university on the inclusive theme, and to analyze from this, the gap of the theme in the initial formation of these teachers, besides the inexistence of the search for a their continuing education that directly affects their students with disabilities at the university for their unpreparedness for inclusive education.

Methodology

This research has a qualitative approach, since it works with descriptive information and attribution of meanings. The written word is valued both in the process of obtaining data that express the meaning of the facts and in the transcription of the results, characterizing it as descriptive. In this approach, we value the researcher's direct and prolonged contact with the situation being studied and the subjects present in it (GODOY, 1995). In addition, the research is also configured as exploratory, by analyzing the reports/facts, reflect, record and interpret to reach conclusions.

The type of research is the case study, which corresponds to one of the ways of conducting a qualitative empirical research on an ongoing phenomenon in its real context. It

starts from the premise that it is possible to explain a given phenomenon by intensively exploring a study unit or several study units to enable comparative analysis (LIMA, 2004). In this type of research, an aspect of an individual is analyzed in depth. This can be reaffirmed by the very objective of the research, which is to analyze the perspectives of chemistry and mathematics teachers from undergraduate courses at a federal university regarding the educational inclusion of students with disabilities in higher education.

Thus, the research was conducted in a federal institution and had the participation of professors of Chemistry and Mathematics. Initially, a bibliographic survey on the theme Inclusive Education was conducted through internet access and the university library. Then, a semi-structured interview was conducted with 6 teachers: 3 teachers from Mathematics Teaching and 3 teachers from Chemistry Teaching. All teachers have a degree. In addition, it was found that they completed the initial training between 1990 and 2004 and with master's and doctorate degrees in the area of teaching/education in chemistry or mathematics. Two professors did postgraduate studies, one did specialization in science education and the other in chemistry. Regarding teaching time in this institution, all participants presented a period of 5 to 9 years. In addition, they reported that they teach supervised internship and teaching practice subjects for chemistry or math undergraduate courses, except for one teacher who teaches hard chemistry subjects.

The semi-structured interview conducted with these subjects is directed by a previously elaborated script, composed of open questions, which allowed a flexible organization and expansion of the questions as the information was provided by the interviewee (BELEI *et al.*, 2008). Thus, it is important to understand that the interviews allow the researcher to deepen, to collect evidence in order to verify how the subjects, present in the studied situation, understand their reality. The interview also allows to obtain consistent information that ensures to describe and understand the logic that presides the relationships that are established within a group (DUARTE, 2004). In addition to this instrument, it is important to understand that the researcher himself is a fundamental element of observation, selection, analysis and interpretation of the collected data.

The qualitative data collected through interviews are primary, since they are collected by the researcher himself, and also secondary because they have the bibliographic contribution of other researchers to the theoretical conclusions of this research. The interviews were recorded to record these data and, subsequently, to transcribe them. The amount of recording hours has a total of 2h, 15min. It is important to mention that the transcription remained true to the interviewee's speech and was also valued intonation, pauses, degree of certainty in the

statements, among others. For this, codes and/or signal rules were used, such as to pause or indicate any type of punctuation, except the question mark, using ellipsis (CARVALHO, 2006).

From this, a Content Analysis was performed which is characterized by a set of methodological instruments that apply to diverse discourses. This methodological structure is composed, as a main reference, by a set of communication analysis techniques that can use systematic procedures and objective description of the contents presented by the analyzed messages (BARDIN, 1997). It is divided into three phases: establishing the unit of analysis (which refers to the basic element of analysis), determining the categories of analysis (which refers to the selection and classification of data; categorization that deals with the identification of the subjects addressed in the communication) and select a sample of the analysis material (which deals with the criteria adopted for sample selection) (JUNIOR; CARVALHO, 2005). Therefore, this analysis consists of the detailed reading of all transcribed material, the identification of words and word sets that have meaning for the research, as well as the classification into categories.

It is important to understand that categories can be developed by the researcher from theoretical/conceptual references or after data collection. For this work, the categories were elaborated through the interviews. Thus, three categories were elaborated: training of trainers, conception of inclusive education and notion of working with a student with disabilities. The first category aimed to analyze if the teachers had the approach of the inclusive theme in their initial formation or some kind of experience and if after their graduation they sought some kind of qualification for an inclusive teaching. The second concerns the ideas, concepts and opinions of teachers about inclusive education, with the purpose of analyzing if they had knowledge about what the subject was about. And finally, the third category aimed to analyze whether teachers had sufficient knowledge to work with a student with disabilities, for example, a blind student.

Data analysis

Training of trainers

Regarding previous experience working with students with disabilities, two teachers reported that this aspect only occurred while working in basic education. P2, for example, mentions his experience in an institution with a student who had no report, as can be seen in his speech.

[...] ah in the math degree maybe with a certain maturity... some time already teaching I identified a student with difficulty... I presented to the coordination of the university course [...] so I had a extremely intelligent student... answered... attended the class attentively [...] but when he took the test to do he could not do... if I sat with him and was asking he would answer me [...] then read to him to answer me right... did this kind of evaluation... I explained to the students... the students understood at the time... that sometimes there is also a problem with the... oh I'm being evaluated like this because you're doing this to him... so I want too [...] but I believe it could be dyscalculia [...]. [P2]³

From P2's speech, it can be analyzed that the lack of an initial and continuous formation that contemplates the inclusion theme, leads to the difficulty and even the misconception of the professional to differentiate a student with learning disorder (Dyscalculia) from a student with disabilities. For, according to the teacher's report, he believes that Dyscalculia is a deficiency. With this, it is important to clarify that:

Learning disorders include a specific disability, such as reading, writing or math, in individuals who present significantly below-expected outcomes for their level of development, education and intellectual ability (ROTTA *et al.*, 2016, p. 108)⁴

Among the LD, there is the “Mathematical Disorder” cited in ICD-10 as “Arithmetic Skills Specific Disorder” and internationally known as Developmental Dyscalculia (DD), which is a specific disorder that affects the acquisition of arithmetic skills in children with normal intelligence (SILVA; SANTOS, 2011). Thus, dyscalculia is a learning disorder, not a disability.

The data revealed that none of the participants had contact with the inclusion theme in their initial formation. They pointed out that at the time of graduation the teaching degree consisted of a traditional curriculum. They also claimed that changes in legislation for universities to start complying with legal regulations are "recent". And that even as a result of this, other curricular components were inserted in the undergraduate courses to contemplate the theme inclusion. For this reason, and at the time of their teaching degree, from 1990 to 2004, inclusion had not yet been put into practice. However, it is important to note that the history of

³ [...] ah na licenciatura em matemática talvez já com uma certa maturidade... algum tempo já de docência eu identifiquei um aluno com dificuldade... apresentei para a coordenação do curso para universidade [...] então eu tive um aluno que extremamente inteligente... respondia... participava da aula atentamente [...] mas quando ele pegava a prova para fazer ele não conseguia fazer... se eu sentasse com ele e fosse perguntando ele ia me responder [...] então lia para ele para ele me responder né... e:: fazia esse tipo de avaliação... expliquei para os alunos... os alunos entenderam na ocasião... que as vezes também há muito problema com a... ah eu estou sendo avaliado desse jeito porque que você esta fazendo assim com ele... então eu também quero [...] mas eu acredito que podia ser discalculia [...]. [P2]

⁴ Os transtornos da aprendizagem compreendem uma inabilidade específica, como de leitura, escrita ou matemática, em indivíduos que apresentam resultados significativamente abaixo do esperado para seu nível de desenvolvimento, escolaridade e capacidade intelectual. (ROTTA *et al.*, 2016, p. 108)

Special Education in Brazil began in 1854 and educational policies for people with disabilities are initiated by National Education Guidelines and Bases Law no. 4,024 of 1961. Special Education was reaffirmed in the 1988 Federal Constitution, particularly, in Article 208

P2 characterized the undergraduate degree in Brazil as an applicational course. And that the contact with this theme occurred only in his master's degree due to the existence of a research group focused on the area of inclusive education, as can be analyzed in his speech.

No... it was not because the:: the period when I did my math teaching degree we still had a teaching degree in Brazil still very focused on the bachelor degree... had not yet had the big change in the legislation that was from 2001 right... with the insertion of the practice as a curricular component... so we did not have eh:: these discussions in our undergraduate curriculum right... the teaching practice was not the focus of training in the degree in moment when i graduated [...] i just went ah:: to discuss from the moment i get into math education in Rio Claro and there opens a range of... of possibilities right... more comprehensive so... there in Rio Claro there is a research group that works inclusive math education for some time so... I followed the discussions [...]. [P2]⁵

Two teachers P2 and P6, even without training to guide a student or attend a student with a disability, approached the subject in their supervised internship subjects, as can be observed in their speech.

[...] last year in the supervised internship discipline... ah:: we during classes éh:: I tried to bring teachers from elementary school to talk about inclusion [...] from the assumption that the more I know the less prejudice I have about that subject [...] so they brought the material... they even brought the reports without identification but they brought them to see how the inclusion process works right inserting this student at school in that class... the work with the teachers... is different when you as a university professor talk about inclusion and when you bring someone who experiences inclusion day by day there at school [...] the teachers who came and they liked it a lot and the students also... after that we made a day with these teachers at Pibid with the students of all teaching degrees so that they could also ask questions about it [...]. [P2]⁶

⁵ Não... não foi porque a:: o período em que eu fiz a licenciatura em matemática a gente ainda tinha um curso de licenciatura no Brasil muito ainda com enfoque no bacharelado... não havia tido ainda a grande mudança na legislação que foi a partir de 2001 né... com a inserção da prática como componente curricular... então a gente não tinha éh:: essas discussões no nosso currículo de licenciatura né... a prática docente não era o foco da formação na licenciatura no momento em que eu me formei [...] eu só fui ah:: discutir a partir do momento que eu entro em educação matemática em Rio Claro e ai abre-se um leque de... de possibilidades né... mais abrangente então... lá em Rio Claro existe um grupo de pesquisa que trabalha educação matemática inclusiva já um certo tempo então... eu acompanhava as discussões [...]. [P2]

⁶ [...] o ano passado na disciplina de estágio supervisionado... ah:: a gente durante as aulas éh:: eu procurei trazer professores da escola básica da educação básica para falar sobre inclusão [...] parte do pressuposto que quanto mais eu conheço menos preconceito eu tenho com relação àquele assunto [...] então eles trouxeram o material... eles trouxeram inclusive os laudos assim sem identificação mas trouxeram para que eles vissem como que funciona o processo de inclusão né de inserção desse aluno na escola naquela classe... o trabalho com os professores... é diferente quando você enquanto professor da universidade fala sobre inclusão e quando você traz alguém que vivencia a inclusão dia a dia ali na escola [...] os professores que vieram gostaram muito e os alunos também...

Thus, it appears that teachers seek knowledge about inclusion in readings of specialized teachers. P1, for example, mentioned that he had contact with the didactic material of the Benjamin Constant Institute of Rio de Janeiro. He also reported that when he coordinated the Institutional Teaching Initiation Scholarship Program (Pibid, Portuguese initials), he was unable to provide the necessary guidance on working with a student with a disability for his undergraduate students, as can be seen in his speech.

Ah:: yes always I ah:: always I tried to evolve in that sense... when it started... ah:: in the matter of inclusion right... ah:: when I started to hear about inclusion and so on I started ah:: read something about it... and really thinking what it would be like if we received a student... in the blind case right... that ah:: the inclusion of such a person with a lower IQ and such... I think you can get around... now more extreme cases that the guy is totally blind right... has no vision there I... I find it difficult... so I always tried to read so... I had contact with the didactic material of the Benjamin Constant Institute of Rio de Janeiro right... and I when I coordinated Pibid here at unifei [...] our students who go to the schools, right, had contact with people Inclusion... then we are never prepared I spoke like this... I spoke to the student right... do what your heart thinks best and such... that if you make a mistake you will be making a mistake with good intention, right... ah:: because I think so... be prepared to work with this situation... there are few people like that, right [...] and we will definitely receive blind students... deaf student, right... so we have to prepare for this... if one day will be prepared, right. [P1]⁷

Analyzing the speech of P1, it is possible to notice that the lack of knowledge about the inclusive theme is also related to continuing education. Thus, it can be said that it is necessary to reflect not only on the work of teachers with students with disabilities at the university, but also on the guidance of these teachers to their students of undergraduate courses on inclusive education.

Four teachers reported that they only participate sporadically in the Inclusion Seminars held annually at the university. The justification for this fact is based on the overcrowding of

depois nós fizemos um dia com esses professores no Pibid com os alunos de todas as licenciaturas para que eles também pudessem tirar dúvidas com relação a isso [...]. [P2]

⁷ Ah:: sim sempre eu ah:: sempre eu procurei evoluir nesse sentido... quando começou... ah:: na questão de inclusão né... ah:: quando eu comecei a ouvir a falar de inclusão e tal ai que eu comecei ah:: ler alguma coisa a respeito e tal... e a pensar realmente como que seria se a gente recebesse um aluno... no caso cego né... que ah:: a inclusão de pessoa assim com um QI mais baixo e tal... eu acho que da pra contornar... agora casos mais extremos que o cara é cego totalmente né... não tem visão nenhuma ai eu... eu acho difícil... então sempre procurei ler assim... tive contato com o material didático do instituto Benjamin Constant do Rio de Janeiro né... e eu quando eu coordenei o Pibid aqui na unifei [...] os nossos alunos que vão até as escolas né tinham contato com pessoas de inclusão... ai a gente como nunca ta preparado eu falava assim... falava para o aluno né... faz o que o seu coração achar melhor e tal... que se você errar você vai estar errando com uma boa intenção né... ah:: porque eu acho assim... estar preparado para trabalhar com esta situação... são poucas pessoas assim né que estão [...] e a gente vai com certeza vai receber ainda aluno cego... aluno surdo né... então a gente tem que se preparar para isso... se é que um dia vai estar preparado né. [P1]

their agendas and the difficulty of reconciling events with their professional obligations. However, they demonstrated the importance of participating more actively in the event.

Conception about inclusive education

It was found that teachers consider the concept of inclusive education as an education for all. For them, this education is not intended to meet the need for only one student with a disability, but to reach all different subjects in the classroom. This aspect dialogues with Carvalho (2011, p. 3), who states “it is necessary to consider the different characteristics of each student in his class. Inclusive education is not a practice for certain students but for everyone without distinction”. From the speech of P1, this aspect can be noted.

It's complicated... actually ah:: inclusive educati/... what I mean by inclusive education, right, ah:: you have to teach in such a way ah:: that you include all people right... so if a person has some ah:: difficulty and such ah:: you have to... teach in such a way that this person does not ah:: is not a reference like that... that is... I have a class over there 20 students i can't ah:: teach thinking about that person who has a learning disability, right... th/... so i have to plan the class so that the other nineteen who have a bigger learning facility than that one/...that student [...] we are not really prepared to give a class ah:: inclusive... what we do is... in practice, right... is assuming an average, right, d/ ... of the class [...] you have a Gaussian distribution right ah:: so there is an average, right, and a standard deviation of that class... so you go more or less to the average right [...]. [P1]⁸

Similar to P1, P3 considers inclusion to include everyone in a classroom. It is worth mentioning that, he was the only interviewee who mentioned knowing the current terminologies.

Yes... the little I have reading... I do not have a a training very... but the little I have reading... the idea of:: inclusion is not just thinking about that person who has it, right, have special needs, but to think about how she can really participate as a whole so I see the inclusion that has to favor both who is theoretically being included and others to just have this perception of the possibility of working together, then the language, we have to be careful, right,

⁸ É complicado... na verdade ah:: a educação inclu/...o que eu entendo por educação inclusiva né ah:: você tem que ensinar de tal forma ah:: que você incluia todas as pessoas né... então se uma pessoa tem alguma ah:: dificuldade e tal ah:: você tem que... ensinar de tal forma que essa pessoa não ah:: não seja uma referencia assim... ou seja... eu tenho uma turma lá de 20 alunos eu não posso ah:: dar aula pensando naquela pessoa que tem uma dificuldade de aprendizado né... ent/...então eu tenho que planejar a aula para que os outros dezoito que tem uma facilidade de aprendizado maior do que aquele um/...que aquele aluno [...] na verdade a gente não está pre-pa-ra-do assim para dar uma aula ah:: inclusiva... o que a gente faz é... na prática né... é assumir uma média né d/...da turma [...] você tem uma distribuição de Gauss né ah:: então tem uma média né e um desvio padrão dessa turma... então você vai mais ou menos para a média né [...]. [P1]

about languages that are more appropriate, because, before we spoke disabled today we talk about people with or without disabilities [...]. [P3]⁹

On the other hand, the data reveal that the participants presented not so comprehensive answers, that is, they consider that the inclusion should happen only in the classroom. P2 cited the deepening of the concept of readings made by Professor Ubiratan D'Ambrosio and raised a broader conception of inclusion:

So... I think about inclusive education in a broader way, right... we:: in mathematical education we have some proper authors already eh:: some theorists about inclusive mathematical education [...] are not only characterized as inclusion students that:: ah:: with special needs... mathematics education wants inclusion of women... black people, right, éh:: poor... that is... any kind of inclusion... is a general way to mathematics education is what is valued, right... and:: inside thes/... from this perspective I have éh:: studied and made readings to... to deepen... about éh:: two such theorists... in particular... Professor Ubiratan D'Ambrosio and Professor Oriscovi Smose [...]. [P2]¹⁰

Only P4 considered that in order to effect inclusion it is necessary to know different pedagogical practices to be used in working with students with disabilities. In addition, reports that at the university they do not experience these inclusive practices:

[...] this inclusive education foresees working with students who have special needs but not only the work, I think is a welcome, is to prepare the place to receive thinking practices that do not separate them from the class, but on the contrary that the class can do with them to value the skills they have, right, I think it is on this path now if he asks, for example, if here at UNIFEI we have inclusive practices, we do not [...] I've participated in a workshop of this theme in which the teacher put us in the place of a deaf blind person to do the activity, we feel the difficulty that the person feel, I haven't done it yet but I think it's something missing. [P4]¹¹

⁹ É... pelo pouco que eu tenho de leitura... eu não tenho né uma formação muito... mas pelo pouco que eu tenho de leitura... a ideia da:: inclusão né não é pensar só naquela pessoa que tem né tem necessidades especiais mas sim pensar em como que ela pode realmente participar como um todo então eu vejo a inclusão que ela tem que favorecer tanto quem está teoricamente sendo incluído quantos os outros para justamente ter essa percepção da possibilidade do trabalho conjunto então a linguagem a gente tem que tomar cuidado com né linguagens que são mais adequadas então antes falava portador de deficiência hoje a gente fala pessoa com ou sem deficiência [...]. [P3]

¹⁰ Então... eu penso na educação inclusiva de uma forma mais ampla né... a gente:: na educação matemática nós temos alguns autores já próprios éh:: alguns teóricos sobre a educação matemática inclusiva [...] não se caracteriza apenas como inclusão os alunos que:: ah:: com necessidades especiais... a educação matemática ela quer inclusão de mulheres... negros né éh:: pobres... ou seja... qualquer tipo de inclusão... é de uma maneira geral para a educação matemática é o que ela preza né... e:: dentro dess/...dessa perspectiva eu tenho éh:: estudado e feito leituras para... para aprofundar... sobre éh:: dois teóricos assim... em especial... professor Ubiratan D'Ambrosio e professor Oriscovi Smose [...]. [P2]

¹¹ [...] essa educação inclusiva ela prevê o trabalho com alunos que tenham necessidades especiais mas não só o trabalho eu acho que é um acolhimento é preparar o local para receber pensar práticas que não sejam que não separem eles da turma mas ao contrário que a turma possa fazer junto com eles que valorize as habilidades que eles tem né eu penso que seja nesse caminho agora se ele perguntar por exemplo se aqui na UNIFEI a gente tem práticas inclusivas não [...] participei de uma oficina dessa temática em que a professora nos colocou no lugar de

Teachers' conceptions of inclusive education are possibly linked to recent discussions about this concept in different social classes. The analysis revealed the difficulty that teachers had to define and explain what inclusive education is. Thus, it is noteworthy that an inclusive institution must enable students to work together regardless of any difficulties or differences they may have, whether physical, intellectual, social, economic, among others. But different learning styles must be respected to ensure quality education for all through appropriate curriculum, organizational modifications, teaching strategies, resource use, and so on. Inclusive education is also an effective means to combat discriminatory attitudes, as it recognizes and respects differences (AGUIAR, 2004).

Therefore, it is necessary that teachers responsible for inclusion have adequate conceptions about inclusive education. Knowledge is an essential factor in building a truly inclusive society. Also often used language can regress to prejudice with people with disabilities, even involuntarily. Thus, it is crucial that teachers of teachers understand the terminologies used and the concepts employed for inclusion.

Notion of working with a student with a disability

After analyzing the education and conception of inclusive education of teachers, the notion they have in working with a student with disabilities, especially a blind student, was analyzed. In this topic, it is clear that the lack of initial and continuing education that includes the inclusive theme can have direct negative consequences on the inclusion process of a blind student that these teachers may have in the university.

Through the data it was possible to realize that the teachers could not think about how to work with a blind student. On the other hand, they recognized that the lack of preparation is directly linked to the lack of training, and that they would resort to studies, professionals specialized in the subject and to the University's Center for Accessibility and Inclusion. One of them mentioned looking for lectures and productions by Professor Gerson Mol of the University of Brasilia (UNB), as follows:

Yeah, I think that every kind of disability I was going to have to study first, to know this of the blind person I remember a lot of lectures I've seen at a congress of a professor of chemistry teaching, Professor Gerson mol there at UNB [...] I remember just one of his lectures talking about the student with visual impairment... which to chemistry people at first seems even

um cego de um surdo para fazer atividade a gente sentir a dificuldade que ele sente eu ainda não pus em prática isso mas eu acho que é uma coisa que falta. [P4]

unimaginable... but how you will not see the reactions, like, how a student who can't see the reactions going on will be able to learn chemistry, right, and the speeches of Professor Gerson Mol were a lot in this sense, right, of showing that there are another perceptions, right, another ways to the student cognitively comprehend that content and not only the visual way, so, I know that in literature there are some ways [...] so when I need it I can access or even go after colleagues who have already had the experience or groups of those who have a more specialized knowledge about it [...]. [P5]¹²

It is important to note that the study teacher quoted in P5's speech is not a researcher in the field of inclusion, but in fact he has a degree, a master's degree and a doctorate for the hard area of chemistry. Therefore, if the continuing education that P5 seeks is based on the studies of other professionals, it is important that they are directly linked to the area of inclusion.

Now, the speech of P3 makes it possible to understand that, even without the specific knowledge, to work with a blind student, the teacher knows teaching strategies that facilitate and include all students in the classroom:

[...] I had already participated in congresses, right, I was in this area that works with inclusive education so I've seen so there are several materials that are already developed... is periodic table in Braille and the interesting thing is that this table is tactile and it is not only for the student, right, disabled, it is also for the student without disability it owes to the advice of use, is to be used for everyone... this is the question of not excluding... look this is for you and this is for others [...] instead of just talking for example in the part of atomic models, right, that is a descriptive part so let the student make concrete models so that the student can also grope, right, is the question of I don't know exactly how to deal with it but I've heard comments so talk to each other so you can talk about colors because they create their own color references that aren't the same as I'm talking about but they understand that the things are called different colors, right, but I know I would have a hard time... for the teaching practice and supervised internship disciplines I believe that at least would have to be careful to get the texts that we use, a lot of text, a lot of discussion in room, right, would have to be very careful with the gesture to avoid that things are shown only in the gesture, that everything is accompanied by the words, I think this would be an effort but I think it would be rewarding also to have this person included in the classroom [...] I have a visually impaired student in distance education [...] she is not totally blind she has low vision in both eyes so she said she has a reader that magnifies the screen, she has some features already on her computer of accessibility some assistive technologies

¹² Pois é eu acho que cada tipo de deficiência eu ia ter que estudar primeiro para saber esse do cego eu me lembro muito de algumas palestras que eu já vi em congresso de um professor da área de ensino de química o Professor Gerson mol lá da UNB [...] eu me lembro de justamente de uma palestra dele falando sobre a questão do aluno com deficiência visual... que para gente assim da química no primeiro momento parece até inimaginável... mas como assim não vai ver as reações como que um aluno que não consegue ver as reações acontecendo ele vai conseguir aprender química né e as palestras do Professor Gerson mol iam muito nesse sentido né de mostrar que existem outras percepções né outras formas do aluno cognitivamente compreender aquele conteúdo e não apenas pelo visual então assim eu sei que na literatura tem alguns caminhos [...] então na hora que eu precisar eu posso acessar ou ir atrás mesmo de colegas que eventualmente já passaram pela experiência ou de grupos que tem um conhecimento mais especializado sobre isso [...]. [P5]

and the test we send it is in size 16 that I send 11 to the students, to her I send 16 then send everything increased [...]. [P3]¹³

However, P3 did not mention specific strategies for working with a blind student, so it is possible that he does not have a thorough understanding of the subject and, although recognizing that he would have difficulties, shows no interest in the search for a continuing education focused on the topic, even if it becomes necessary in the future to know these inclusive practices to be successful in working with a student with a disability. On the other hand, P3 and P4 only knew the method of printing Braille texts, which was among NAI's (Integrated Attendance Center, Portuguese initials) actions. P4 highlighted the importance of using group activities in the classroom through inclusive practices:

If he is completely blind I think that is to be very careful with speech, so that it is very clear, calmer, so that he can follow the reasoning, right, and at the same time try to produce materials that he can, by touch... if I will give a text to read so have someone there, I would need someone to help me to pass this to Braille or choose a text that already has Braille so always being careful that he can participate in these activities and also, I don't know, think activities that the other colleagues will also do blindfolded and to feel the difficulty he feels, right, or to be on the same level, would be an opportunity to put into practice even what I commented from the workshop with you. [P4]¹⁴

Given the above, it appears that the lack of preparation and lack of knowledge of these teachers are directly related to the initial training received (PLETSCH, 2009). On the other hand, it is observed that there is an absence of concern on their part to obtain knowledge on this

¹³ [...] eu já tive participando em congressos né eu fui nessa área que trabalha com educação inclusiva então eu já vi assim tem diversos materiais que já são desenvolvidos... é tabela periódica em Braille e o interessante é que essa tabela é tátil e ela não é só para o aluno né é deficiente ela também é para o aluno sem deficiência ela deve ao conselho do uso é ser usada aquela para todo mundo... isso que é a questão de não tá excluindo... olha essa é para você e essa é para os outros [...] ao invés de só falar por exemplo na parte dos modelos atômicos né que é uma parte descritiva então é deixar o aluno fazer modelos concretos para o aluno também poder tatiar né é a questão das cores eu não sei exatamente como lidar com ela mas já ouvi comentários assim conversa um com o outro assim é de que pode se falar nas cores porque eles criam as próprias referências de cor que não seja a mesma que eu tô falando mas que eles compreendem que as coisas são chamadas de cores diferentes né mas eu sei que eu teria muita dificuldade... para as disciplinas de prática de ensino e de estágio supervisionado acredito que menos teria que ter o cuidado de conseguir os textos que a gente usa bastante texto bastante discussão em sala né teria tomar bastante cuidado com o gestual para evitar que coisas sejam mostradas apenas no gesto que tudo seja acompanhado das palavras eu acho que assim seria um esforço mas eu acho que seria gratificante também ter essa pessoa incluída na sala de aula [...] eu tenho uma aluna deficiente visual na educação a distância [...] ela não é totalmente cega ela tem baixa visão em ambos os olhos então ela falou que ela tem um leitor que aumenta a tela ela tem alguns recursos já no computador dela de acessibilidade algumas tecnologias assistivas e a prova a gente manda ela é no tamanho 16 que eu mando 11 para os alunos para ela manda 16 então manda tudo aumentado [...]. [P3]

¹⁴ Se ele for completamente cego eu acho que é tomar muito cuidado com a fala para que ela seja muito clara mais calma para que ele possa acompanhar o raciocínio né e mas ao mesmo tempo tentar procurar produzir materiais que ele possa pelo Tato... se eu vou dar um texto para ler então ter alguém aí precisaria de alguém me ajudar para passar isso para o Braille ou escolher texto que já tem em Braille então sempre tomando cuidado que ele possa participar dessas atividades e também sei lá talvez sei lá pensar em atividades que os outros colegas também façam de olhos vendados e para sentir a dificuldade que ele sente né ou para sentir estar no mesmo nível seria uma oportunidade para por em prática até o que eu comentei da oficina com você. [P4]

subject. In addition, it is perceived the difficulty to create and develop different strategies in working with these students, this lack of training has direct consequences on the learning of students with disabilities.

Final considerations

From the reports of the participating professors, it can be stated that the access and permanence of students with disabilities in the University is still recent. So, to ensure this, it is necessary to eliminate several barriers, both pedagogical and attitudinal and accessibility, still existing at the University. Commonly, university teachers adopt exclusionary pedagogical practices in the classroom that do not promote inclusion, only the integration of students with disabilities. However, it is worth remembering that these teachers do not feel prepared to work with a student with a disability due to the gap in their training. However, even aware that this access is being increasingly guaranteed, teachers are still not concerned with seeking a continuing education to work with these students, sometimes even are unaware of the importance even having a core of accessibility and active inclusion. which promotes actions to enhance the process of educational inclusion. From this, the students come to the classroom and these teachers are unaware of inclusive strategies and practices, thus, do not adequately meet the conditions necessary for the learning of each student and do not promote their permanence in the university.

In the meantime, it is important to emphasize that the teacher should contribute to this inclusive teaching, with research and extension in the area of special educational needs. In addition, inclusive education makes it possible to combat discriminatory attitudes of learners and to recognize and respect differences from the way the teacher conducts this teaching.

Thus, from the analyzes performed, it can be concluded that it is essential that the current undergraduate courses in Brazil include in their curriculum, subjects that deal with inclusion and inclusive education, in order to prepare them deeply to work in an inclusive teaching that avoids exclusionary pedagogical practices and mainly eliminates attitudinal barriers arising from superficial knowledge on the subject. In addition, already acting teaching degree teachers who have not had contact with inclusion in their initial education need to pursue this training to adequately guide graduates and succeed in future work with a student with disabilities at the university.

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