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SIGN LANGUAGE ASSESSMENT, SIGN LANGUAGE ACQUISITION AND SIGN LANGUAGE LITERACY

AVALIAÇÃO DA LÍNGUA DE SINAIS, AQUISIÇÃO DE LÍNGUA DE SINAIS E ALFABETIZAÇÃO NA LÍNGUA DE SINAIS

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ABSTRACT

The interfaces between areas of Education and Health benefit Deaf Studies and the deaf community. One of the contributions of these areas is sign language assessment instruments and the possibilities of using these instruments to outline the literacy profile in sign language and identify possible disorders that could compromise it. The impact of well-designed assessment instruments affects deaf individuals, highlighting these tools as indispensable items for the implementation of linguistic and educational policies, which have been developed in recent years for the Brazilian deaf community. This article presents and discusses central Brazilian studies on sign language-based assessment and their impact on atypical sign language intervention in educational and clinical contexts. This article presents a reflection on the use of assessment instruments to identify these disorders and the moment in the literacy process that a deaf person finds. Starting with contributions from the Health area on acquisition, literacy and language assessment, an assessment instrument already applied in the interaction between clinic and school is presented.
Keywords: sign language; language acquisition; literacy; language assessment.

RESUMO

As interfaces entre áreas da Educação e da Saúde beneficiam os Estudos Surdos e a comunidade surda. Uma das contribuições dessas áreas são os instrumentos de avaliação da língua de sinais e as possibilidades de uso desses instrumentos para o delineamento do perfil de alfabetização em língua de sinais e a identificação de possíveis desordens que o possam comprometer. O impacto de instrumentos de avaliação bem elaborados atinge os indivíduos surdos, alocando essas ferramentas como itens indispensáveis para a implementação das políticas linguísticas e educacionais, que têm sido desenvolvidas nos últimos anos para a comunidade surda brasileira. Este artigo apresenta e discute os estudos centrais do Brasil sobre avaliação baseada em língua de sinais e seu impacto na intervenção em língua de sinais atípica em contextos educacionais e clínicos. Este artigo apresenta uma reflexão sobre o uso de instrumentos de avaliação para a identificação dessas desordens e do momento do processo de alfabetização em que a pessoa surda se encontra. Tendo como início as contribuições da área da Saúde sobre aquisição, alfabetização e avaliação de linguagem, apresenta-se um instrumento de avaliação já aplicado na interação entre clínica e escola.
Palavras-chave: língua de sinais; aquisição de língua; alfabetização; avaliação de linguagem.

Introduction

Education and Health are recurring themes in Deaf Studies and played an essential role in the history of deaf communities, marking their interdisciplinarity. The models of disability, the educational philosophies framework to Deaf Education, and how health professionals see Deaf people are critical points leading to frequent and disagreement-based discussions. Tensions between and within these areas show a diversity of ideas, intentions and propositions that are, to a greater or lesser degree, accepted by the Deaf community.

The clinical and the educational environments have different focuses when dealing with a Deaf person. Its functions, bases, objects, aims and importance meet different demands based on specific training and legal regulations delivered to each area. These are environments that can walk in parallel, with their interventions poorly interconnected, or they can intersect to provide more effective care.

The main objective of educational intervention is to guide the student to acquire skills and competencies related to a specific curricular component, usually pre-established by the educational institution, or organized by the management of the area or government bodies – the school curricula. These curricula have several possibilities of organization that vary according to the theoretical background adopted and may change according to the place of its elaboration. They are usually organized into areas of knowledge (curriculum components or subjects like Science, Mathematics, Languages, etc.) that comprise a set of contents (also called learning and development objectives or knowledge) to be the aim of the teaching-learning process to the student within a specified period.

Relayed to language curricula like the documents proposed by Brazil (2018) and São Paulo (2019), the educational approach initially advocates the enhancement of the ongoing process of language acquisition and keeps its main emphasis on the teaching of the written modality of the language, its use in different situations and to the enjoyment of written literature in the language in question. These aims occupy most of the years of study of a child and young person. In this educational process, the metalinguistic skills tend to focus on reading and writing acquisition and the prescriptive use of written language. There is no focus on disorders that the student's language performance may exhibit, and when some disorder is identified, the schools refer the case to health services, commonly to Speech and Language Therapy services. The language disorders diagnosis made by the clinical team then serves the educational team in terms of adapting strategies that allow the student to reach the expected learning objectives, focusing on the content to be learned without the intention of rehabilitating the language disorder.

On the other hand, the clinical intervention in language disorders aims to prevent, diagnose, and treat language skills disorders, whether for issues related to delay in the onset of language acquisition, developmental disorders, or the occurrence of acquired disorders. The process that allows the diagnosis and intervention for the adequacy of language disorders is based on an initial language complaint, confronted by the professional using screening and assessment tools and following the intervention with the mobilization of metacognitive and metalinguistic skills. The focus is placed on the late-developed, undeveloped, or lost functionality. There is no intention of developing content such as, for example, teaching an unlearned language, but in the rehabilitation of language processing and consequent optimization of communicative skills.

The objective of this article is to present a reflection based on contributions that lie at the intersection between the areas of Education and Health. The aim is to focus on the use of assessment instruments to identify atypical sign language processing and the development of sign language literacy among deaf people, observing how areas can deal with these instruments and their impact on the deaf community.

A contribution from the area of Health

Atypical sign language is distinguished from the linguistic variation present in all-natural languages. Linguistic variation, although it can be the target of prejudice, is accepted by a speech community as something belonging to the language and is a phenomenon expected by speakers of a given variant and speakers of other variants. These variations also occur in sign languages (Lucas, 2001; Schembri and Johnston, 2007; Temoteo, 2010; Martins, 2012). On the other hand, linguistic atypia is identified as an unwanted alteration, not expected by the speech community, resulting from dysfunctional processes, generating communication breaks, and generally causing suffering in the individual.

Atypical sign language is the manifestation of human communication disorder in sign languages (Barbosa, 2016). The same concepts proposed by Andrade (1996) for human communication disorders expressed in oral languages can be applied to sign languages since disorders in these languages also manifest as developmental disorders, generated by delayed acquisition, or acquired disorders, results from primary deficit - a disease that is not a consequence of another - or secondary - occurring as a consequence of another pathology (Barbosa, 2016).

Language acquisition must begin at the appropriate time for its development to be normal. Late language acquisition or beginning with insufficient input for it to occur satisfactorily can harm language mastery (MCDONALD, 1999), making it possible to notice the difference in production and comprehension skills between a user with early acquisition (at the appropriate time) and another with late acquisition (BARBOSA, 2007).

The process of language acquisition and development is extremely important for the cognitive, social, and personal development of deaf people, and late and inadequate exposure can cause incomplete development of sign language grammar and can, in extreme cases, harm general learning. of the child, especially those who do not acquire fluency until the age of five (WOLL, 1998).

Neurolinguistic studies, such as that of Pénicaud et al. (2012) report that delays in language acquisition can even influence brain development. The authors demonstrated that deaf people with late sign language acquisition exhibited reduced grey matter density in the primary visual cortex.

The importance of sign language in neuronal development is demonstrated in a previous study with the morphometric description of fourteen deaf native users of sign language. Leporé et al. (2010) observed that the volumes of white matter in Broca's area, responsible for language production, were significantly higher for the deaf group compared to the non-signing hearing group. Furthermore, functional neuroimaging studies of the phonological processing of signing and reading in deaf people report greater activation in Broca's area in deaf people than in non-signing hearing people (MACSWEENEY et al., 2009; CORINA et al., 2012).

Procedures for language assessment for health diagnosis in oral languages have been developed since the 1940s, bringing benefits to the evolution of care areas related to language disorders and, since the 1980s, models of evaluation have been interested not only in articulation, vocabulary, and sentence structure but also in semantic and pragmatic aspects (WOLLNER and GELLER, 1984). The syntactic level was the last level explored.

Systematized assessments for language diagnosis in deafness (focused on sign languages) gained the attention of researchers only from the 1990s onwards, with a considerable increase from the beginning of this century. The concern with researching methodologies for assessing the deaf person's language has motivated several researchers (HERMAN et al., 1999; MORGAN, 2006; MORGAN, 2007). Investigations in this field reach increasingly higher levels of development within the study of

language (LICHTIG, 2004; ATKINSON et al., 2005; LEVY; BARBOSA, 2005), cognition (CARVALHO, 2005; BARBOSA, 2006; MORGAN, 2006) and its applications in the social context, mainly with the new proposals for Speech and Language Therapy activities in deafness (LODI, 2000; LEVY and BARBOSA, 2005; ATKINSON et al., 2005). Currently, the various levels of linguistic analysis have been contemplated, allowing health and education professionals to observe the deaf community not only in their proficiency in sign language but in the degree of language mastery and linguistic and cognitive development (Sign Language Assessment, 2021). These tests can be used for clinical purposes; however, few health services provide such procedures.

In Brazil, few instruments have been designed for the assessment of atypical sign language. Bilingual assessment instruments were initially proposed by Mecca et al. (2002), an initial publication of the Laboratory of Educational Audiology works coordinated by Professor Dr Ida Lichtig, from the University of São Paulo, Brazil, culminated in the Program of Speech and Language Therapy for Families of Deaf Children – PIFFCS (LICHTIG et al., 2004). From this laboratory, other evaluation works based on sign language were produced and published (MECCA, 2005; BARBOSA, 2007).

In the last decade, specific instruments for Libras were published to verify possible disorders in production and/or understanding. Quadros and Rebelo (2011) proposed an assessment instrument for Libras focused on the development of deaf children for use by health and education professionals. Barbosa and Lichtig (2014) proposed a bilingual instrument for analyzing the communication skills of deaf children. Costa (2015) proposes a protocol for phonological assessment of Libras at the level of parameters described in the literature, and Lopes (2016) proposes an instrument to verify phonological awareness in Libras, specifically identifying minimal pairs.

Barbosa and Neves (2017) organized a book with six language and cognition assessment instruments, based on Libras, including an assessment of sign fluency, an assessment of working memory, word and vocabulary learning and a linguistic screening.

The instruments organized by the authors include signing fluency assessment, working memory assessment and word learning test. To provide tools based on sign language to evaluate different aspects of the development and linguistic-cognitive skills of deaf people, the published compilation brings important elements for outlining the profile of linguistic mastery and level of literacy in sign language. Instruments of the type presented by Barbosa and Neves (2017) are extremely important, as they make it possible to evaluate in a fair and culturally sensitive way individuals whose first language is sign language, without the barrier of having to express themselves in a second language and being exposed to an instrument designed for this visual-spatial language; allow the identification of different linguistic profiles, the timing of the literacy process in sign language, in addition to the diagnosis of possible delays, disorders or individual differences in the acquisition/development of sign language; and open paths for more precise research and interventions (educational or clinical) in cognition, language and learning in signing deaf people.

Acquisition versus literacy: identifying profiles in sign language

The difference between language acquisition and literacy may be obvious in contexts in which oral languages are mobilized and in communities that have an established written record. For contexts in which sign languages or oral languages of non-speaking communities are considered, the terms language acquisition and literacy need to be reorganized, as the literacy process will not necessarily consider the written record of the first language of these communities.

Language acquisition is a natural and spontaneous process by which a child, in conjunction with individuals from his or her speaking community, absorbs linguistic knowledge of the language used in his or her community. In the case of sign language, acquisition occurs when the deaf child is exposed to sign language from birth or very early on, by deaf parents or professionals who are fluent in that language.

The acquisition of sign language follows patterns and stages similar to the acquisition of oral languages, such as manual babbling, formation of first words, construction of simple sentences, etc. The process is established over the years until the child, spontaneously, finds his established linguistic knowledge.

Literacy, on the other hand, is traditionally referred to as a process of learning a writing system. This traditional definition has been questioned by researchers in Deaf studies, who understand that, faced with a community in which the written record has not become a consolidated fact, the processes of use and explicit knowledge of the language must be observed differently (KYLE, 2022; MERTZANI, 2022).

The development of explicit knowledge of sign language has been approached as one of the first steps towards what has been called literacy in sign language. Just as in the process of teaching and learning to read and write (a written record of a language), rules and conventions can be established, as well as the development of reading and textual production skills in different registers, such as video and pictorial.

Technological development has allowed other forms of recording besides writing, even for hearing communities that have a consolidated written record of their languages. An example is the use of messaging applications in which, initially, only written texts were used, but with the updating of their resources, audio and video recordings became popular, even facilitating communication for people with disabilities. reading and writing disorders or who are not yet literate.

In sign language literacy, video recordings gain centrality. Metalinguistic exploration, very productive in the explicit teaching of sign language, can be explored in these registers regularly. Furthermore, there are attempts to use written records of sign languages, Sign Writing, with several proposed systems still in the consolidation phase and lacking studies to verify their effectiveness.

The Brazilian Sign Language Skills Screening proposed by Barbosa (2017) can be used in clinical and educational environments, depending on the context of its application and the professional purposes for which the instrument is used.

According to Barbosa (2017), the Screening of Linguistic Skills of Brazilian Sign Language was developed to guide intervention procedures in clinical and educational procedures for deaf people with language complaints. Its application is then foreseen for two realities of professional performance.

An important point to note is that language complaints precede clinical interventions. These complaints, firstly, must reflect the dissatisfaction of the language user or the communicative expectations of their communicative peers concerning their understanding or performance, usually starting with communicative difficulties generated by breaks in the interaction environments. Secondly, the complaints must reflect the difficulties in the development of learning processes identified and reported by teachers of the deaf who are fluent in sign language and who use sign language as the language of instruction. From these complaints, deaf people are referred to health services for diagnosis of atypical production and/or understanding of sign language. Figure 1 below presents one of the most common language complaint flow paths for cases of atypical sign language.

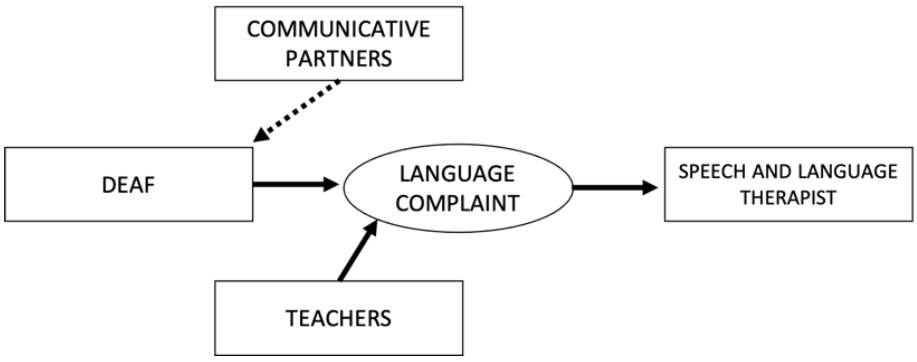

Figure 1. How deaf language complaints reach health services

At the end of the screening application, the screening in question intends to provide the clinician or teacher with notions about the linguistic level at which the main processing difficulties of the tested subject are found.

The instrument was organized into four parts, each one observing a level of linguistic processing. The proposed organization consider the morphological level within the syntactic and speech processing of the language. It was structured to be essential for comprehending and producing sign language for each of these levels.

For the Pragmatic level, based on the work of Gerber and Gurland (1989), Dewart and Summers (1994), and Fernandes (1996), was organized the following questions, to which the examiner should verify whether the skills are present after observing the linguistic performance of the examinee. It is done through a semi-structured interaction that observes the respect for the communicative turn, maintenance of eye contact and topic of conversation, if the subject presents a communicative intention, if revisions are made when there are breaks or requests for clarification when they do not understand and, finally, if the subject behaves appropriately in the communicative environment.

For the Discursive level, the examiner presents a picture and asks the examinee to tell a story about what the picture shows. Based on the work of Bento (2009) and Rathmann, Mann and Morgan (2007), seven characteristics were listed that must be present in the sample: the presentation of events and characters; chronologically adequate organization; clear signed production; presentation of complete syntactic structures; use of descriptive verbs; spatial syntactic organization and correct use of temporal marks.

For the Syntactic level, we developed a sentence comprehension test, based on the work of Nespoulous et al. (1986) and DeRenzi and Vignolo (1962), using three objects that are easily accessible and familiar to the subject (pencil, paper, and glass), with sentences that take into account the spatial syntax of sign language, according to Quadros and Karnopp (2004).

Finally, for the phonetic-phonological level, the author proposes a list of signs crossing phonetic-phonological information based on the works by Mann et al. (2010), observing the parameters of Movement (simple and inside the hands) and Hand Configuration (unmarked and marked). As the objective is not vocabulary analysis, what is observed is only if the sign was correctly produced concerning the parameters of Hand Configuration, Movement, Location, Hand Orientation, Non-Manual Expressions and Number of Hands (QUADROS and KARNOPP, 2004; XAVIER, 2014).

With the protocol proposition (BARBOSA, 2017) presents a first application was made, with the reference data, shown in Figure 2 below:

Linguistic Level	Children		Ault	
	Pass	Fail	Pass	Fail
Pragmatics	0 - 2	3 or more	0 - 1	2 or more
Discourse	0 - 2	3 or more	0 - 1	2 or more
Syntactic	0 - 2	3 or more	0	1 or more
Phonetic-Phonological	0 - 3	4 or more	0	1 or more

Figure 2: Reference score for the screening result (BARBOSA, 2017)

Two later works also used this screening with different aims. Barbosa (2017) analyzed deaf children with atypical sign language, and Neves (2022) analyzed deaf adults with late sign language acquisition. These works presented results that corroborated the findings of Barbosa (2017) and showed that the instrument indicates, in addition to possibly affected levels of linguistic analysis, distinct scores in the screening for deaf people with late onset of Libras acquisition and language complaints, with lower performance for those individuals with language complaints.

In the work of Neves (2022), the results demonstrated contributed to a better understanding of the effects of late acquisition on the processing of a signed language and highlighted the importance of sign language for the linguistic development of deaf people. The results have a direct impact on understanding the linguistic capacity of deaf people to undergo the literacy process in sign language.

The author applied the screening published by Barbosa (2017) to a group of 109 deaf adults with and without delay in acquiring sign language. The performance of deaf people with delayed acquisition of sign language and brain injury showed lower scores, with statistically significant differences between the performance of deaf people with the acquisition of Libras at an appropriate time, deaf people with the late acquisition of Libras and deaf people with brain damage. Participants with acquisition in the ideal period had better results in assessments regarding the pragmatic, discursive, syntactic, and phonetic-phonological aspects of the screening (37%).

The teacher can use this linguistic screening to distinguish whether a deaf child is in the process of acquiring typical sign language or whether it should already be at a more advanced stage, which has a significant influence on literacy. If the screening indicates that the child is acquiring sign language within the standards expected for their age, the focus should be on providing an environment rich in sign language so that they continue to develop in this language naturally and, gradually, explore the process of literacy in sign language, bringing to their explicit knowledge the grammatical characteristics of their language.

If the screening indicates that the child already has mastery of sign language, surpassing the initial stages of acquisition, systematic literacy work can advance. The teacher can begin structured teaching of sign language grammar, deepening the linguistic knowledge that the child acquired in sign languages, such as phonological awareness and vocabulary, in addition to exploring cognitive skills such as working memory and executive functions.

Interdisciplinarity for the language of the Deaf person

Deaf Studies are inserted in a place where interdisciplinarity is recurrent. The history of Deaf Education and the history of deaf people goes through a series of tensions and relaxations that find interfaces in the health area, in the construction of public, linguistic, and educational policies. A benefit of these interactions is a construction of complexity that ends up requiring the conjunction of different points of view. Issues related to the sign language acquisition process, for example, have an important tension that is not only related to the Health area.

Although the approach of health professionals presents a tendency towards normative directions for deaf people, education also deals with their internal divergences. Vieira-Machado and Rodrigues (2021) propose reinterpretations of the history of deaf education. The first author of the forementioned work has been developing important discussions about the minutes of the Milan Congress of 1880, pointing to a revelation in which the genesis of the impositions of the oralist model was the area of Education and that Health adopted a normative approach in a later time.

The fact is that, currently, the clinic has been the starting point for hearing health policies and the diagnosis of deafness, which takes us to a place of interdisciplinarity for working with the deaf community. Health and Education converge in the care of deaf people, keeping their specificities of action and the responsibilities of their actions, these areas have a historical and continuous influence. Its dynamics directly impact the lives of deaf people and, for this reason, harmonization between these sciences is imperative.

Barbosa (2016) describes the process of identifying deaf people with atypical sign language through the interaction between a bilingual speech therapy clinic and the school for the deaf. In that work, the initial procedures of contact and interaction between professionals of the Health and Education services and the flows of referrals to the health service were recorded, and the results of the screening and language assessment procedures were carried out with the deaf referred by schools.

Based on this work, a project was carried out to apply the Screening of Brazilian Sign Language Skills in deaf children from bilingual schools for the deaf in the city of São Paulo. Furthermore, with the screening application, a continuing education course for teachers of deaf schools was offered and taught by the Department of Linguistics of the University of São Paulo.

As Barbosa (2016) described, the interaction between the bilingual clinic and schools for the deaf in the city of São Paulo began with the initial contact with the pedagogical coordinators of the schools and then with the teachers for the deaf appointed by the coordinators. Meetings were held between the clinical team formed by two linguists, a speech therapist and a deaf specialist in language and teachers to present the screening proposal and to offer a continuing education course for deaf and hearing teachers in these schools.

The continuing education course offered took place in parallel with the application of screening to all school students, with theoretical discussions that support screening, language assessment and discussions on atypical processing of sign language. Students who failed the screening were referred, according to the needs of the school and their families, to the bilingual speech therapy clinic of the Faculty of Medical Sciences of Santa Casa de São Paulo. This service has a team of Speech and Language Therapists and a deaf professional specialist in language who provide care based on Brazilian Sign Language for deaf people referred from inclusive schools and bilingual schools to deaf people from the city of São Paulo.

In the clinic, screening is used to guide the first assessment procedures. After applying the clinical language anamnesis, the patients are submitted to screening that guides the choice of assessments to be applied according to the linguistic levels at which the screening failed. Patients who pass all linguistic levels receive speech therapy guidance along with their families (when underage) and are then discharged. Those who fail in one or more linguistic levels are referred to the language assessment process, with the application of tests and deeper analysis to understand the possible disorder. The tests used in the service in question are listed in Figure 3.

Linguistic level Failed	Instrumentos de avaliação usados
Pragmatics	Pragmatic Profile (Dewart e Summers, 1994). Assessment Protocol of Pragmatic-Linguistic Skills – APPLS (Gerber e Gurland, 1989) Pragmatic Assessment - ABFW (Fernandes, 2000).
Discourse	Protocol of Deaf Children Communicative Skills Profile (Barbosa e Lichtig, 2013)
Syntactic	Token Test (DeRenzi; Vignolo, 1962), BSL Production Test - adapted (Herman et al., 2004, s/d),
Phonetic-Phonological	Phonetic-Phonological Protocol (Barbosa, s/d) FONOLIBRAS (Costa, 2015)

Figure 3: Assessment instruments used in the clinic to analyze language levels

In the schools mentioned above, the work developed was based on individual complaints and teachers' complaints. Teachers analyzed the results obtained in the screening to design specific educational procedures for students who failed to apply the screening.

Although the screening was applied to all students at the schools involved in this project, the teachers and educational coordinators of the schools indicated to the team those who, in their perception, had communicative difficulties in understanding or expressing Libras, even having contact with the language inadequate time (no delay in acquisition). Therefore, the identification of these possible disorders was based on the training process of these teachers, with theoretical discussion and analysis of cases described in the literature.

The current conception among some teachers was that the communicative breaks presented by some students, indicative of language disorders, were related to deafness. However, they could not explain why different deaf children with similar linguistic and educational paths presented such distinct linguistic behavior. This first training and awareness-raising process for identifying language disorders continued with reflections on the possibilities of educational action to adapt the educational process based on teaching/learning relationships. From these initial stages of training, discussion and reflection, teachers could apply the screening and make decisions based on its results. Deaf teachers had greater adherence to the process.

The educational goals for deaf children, based on the Common National Curriculum Base (2018) and the Bilingual Curriculum of the City of São Paulo (2019), must consider a series of learning goals listed in these two documents. The evaluation of these students' school performance is based on these objectives, leading teachers to focus their concerns about student performance in their internal and external evaluations, applied by educational managers in cities, states and the country.

The importance of discussing atypical processing of sign language in educational environments is related to students' academic success. The objectives presented by the school curricula are elaborated, assuming students without any disorder. Even the Bilingual Curriculum of the City (2019), a document designed exclusively to guide the education of deaf students, provides for the acquisition of Libras in an appropriate period and does not refer to adaptations needed for students with atypical processing of sign language, although it mentions this possibility.

The teacher of the deaf, then, is entrusted with this responsibility. In addition to facilitating the student's learning process, they should understand their specific needs, assess their skills and challenges, and propose didactic-methodological alternatives that can fill possible gaps so that their learning process can take place properly.

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