

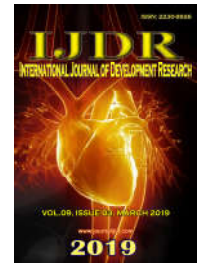


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PEDAGOGICAL MEDIATION IN INCLUSIVE EDUCATION: THE COMPUTER LABORATORY IN THE MUNICIPALITY OF SENHOR DO BONFIM, BAHIA, BRAZIL

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ABSTRACT

This article aimed to analyze the teachers' practices regarding the mediation of teaching for students with specific needs in inclusive school computer laboratories in the region of Senhor do Bonfim-BA. With this goal, we seek to highlight the challenges or solutions that permeate the dynamics of teachers' classes that use computer technology in some classes. In order to increase the understanding of this context, the case study was chosen as the type of investigative method in the qualitative scope. Also, to emphasize this social theme and the use of the computer in the computer lab, we had as base the qualitative research, using the structured interview, with contribution in the open questionnaire and the non-participant observation. Participants contributed data that shows how teachers use computer science to make their classes more engaging and interdisciplinary. With the observation, we verified the personal effort of teachers in mediating the content for their students. We conclude that the provision of continuing education is part of the requests of teachers and that the use of computer technology in the laboratories favors accessibility and learning.

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INTRODUCTION

Providing mediation that provides autonomy and cognitive development to the learner is an important purpose of school instruction. And in today's world, the ability to handle Information and Communication Technologies (ICT) is fundamental for the student to have more access to content and to better socialize knowledge. In this perspective, it is also part of social contact to establish respect for differences and to seek new sources of knowledge; and, thus, the school seeks to adapt to this scenario. The convergence of the inclusive paradigm, adopted by educational institutions, generates unfolding in several aspects; and here we will focus on the dynamics of teacher mediation, using computer labs with students who have specific educational needs. We chose the following research question: how does computer use favor mediation

among students with specific needs? We undertake research with the purpose of generating reflections so that graduate students and educators broaden the understanding about the situations pertinent to this context; and, by extension, to elicit advances in the pedagogical practice commonly employed. Endorsing the need to investigate mediation processes, including those that occur between teachers and students with specific needs in computer rooms, we refer to the explanation of Zabala (1998) when he states that the improvement of human performance involves the knowledge and control of the variables that intervene in them. The complexity of teaching-learning processes, although greater than those of any other profession, does not prevent teachers from having at their disposal and using references that help to interpret what happens in the classroom. In agreement with the above argument, we believe that research is an instrument that provokes the interpretation of "teaching processes" and when the academic community studies the complexity of procedures, knowledge about mediation practices of teaching is generated.

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In this sense, the educational practice in the teaching work is of interest of the social, political, economic and cultural orders. Undertaking research in the context of teachers' practices and knowledge is a scientific effort that can make these knowledge "more accurate or more effective" (Tardiff, 2014, 208). We understand that the more knowledge we obtain about a process or situation, the greater the chances of moving more skillfully and effectively. And in this work, we offer in the following session more clarification of the contours of the object searched. We will clarify some concepts that demarcate the scope of the investigation and the theoretical precepts to which we are affiliated.

Socio-educational conceptions that influence this research:

The school is a social space that receives a great diversity of students. This almost universal reception is the fruit of the construction of the inclusion paradigm. The investigative gaze is inscribed in this social and educational aspect, in the transit between offering of education to the general public, but focusing here the students with specific needs. Therefore, we will highlight in numbered topics the concepts that permeate the relationship of teaching in the paradigm of educational inclusion.

Educational Inclusion: Understanding the Model:

The construction of the inclusion paradigm is a process that has evolved. In the search for a system that offers a more equitable education, we highlight two events that have boosted educational policies. At the international level, the Jomtien Declaration and the Salamanca Declaration are seen as global milestones. The first document cited is the result of the conference held in Thailand in March 1990. One of the directions focused on how to serve people with specific educational needs. Subject to the right to education, the document covered in its article 3, paragraph 5; students who were underserved:

The learning needs of the disabled demand special attention. Steps need to be taken to provide equal access to education to every category of disabled persons as an integral part of the education system (World Declaration on Education for All, Jomtien, Thailand, 1990).

These accepted prerogatives, including by Brazil, served to feed the aspirations of some parents and educators regarding the change in the education system offered in the model of special education, in order to move to the inclusive paradigm. The Salamanca Declaration emphasizes that inclusive school provides an environment favorable to the acquisition of equal opportunity and participation and that all children should, whenever possible, learn together, regardless of any difficulties or differences they may have. The inclusion of children, youth and adults, with special educational needs within the regular system of education, whether private or public, requires changes in educational methodologies and what is very important in teacher training. The challenge extends to the training and qualification of educators to develop educational alternatives appropriate to each specific educational need. As stated in the Declaration of Salamanca (1994, p. 7):

The fundamental principle of the inclusive school is that all children should learn together, wherever possible, regardless of any difficulties or differences they may have. Inclusive schools must recognize and respond to the

diverse needs of their students, accommodating both different styles and rates of learning and ensuring quality education to all through appropriate curricula, organizational arrangements, teaching strategies, resource use and partnerships with their communities. There should be a continuum of support and services to match the continuum of special needs encountered in every school.

The demand to educate the disabled person caught the attention of society and entered the agenda of debates. Influenced by these discussions, the Law on Guidelines and Bases of National Education (Law No. 9.394 / 96), highlights the education of the person with special needs as an obligation of the State, which should welcome this public within the regular network of education.

Receiving the audience with specific educational needs:

The categorization of the public people with special educational needs was an initial definition that evidenced the state's responsibility to include people with disabilities in the regular education system. However, it was realized that this nomenclature did not contemplate other people. Hence, in the Salamanca Declaration the concept of special educational needs had to be expanded to include "all children who are not able to benefit from the school, for whatever reason" (MENEZES 2001). We select the terminology specific educational needs because it understands that it contemplates the students with physical impediments and does not attribute demerit - because for some groups the term deficiency is not well received. Field research has put us in contact with teachers who measure teaching for various specificities, in the next topic we will present concepts related to the specificity reported, as well as the potentialities for mediation with each group.

The specificities in the computer lab:

The specificities are in society and in school. It is necessary to know the needs that are inherent to each student. We will take advantage of this space to clarify each specific need cited by our employees. However we emphasize that in each specificity there is potential for learning in varying degrees and we do not intend to exhaust or deepen the information in this text. Attention Deficit Disorder, Attention Deficit Hyperactivity Disorder (ADHD), is a syndrome that is evidenced by characteristics with chronic delay, lack of concentration or impulsivity. The school needs confirmation via the clinical report so that teachers are informed of how the student can learn. Motivational dynamics and audiovisual stimuli are pointed as elements that favor teaching and learning relationships (NEUROSABER, 2016). Dyslexia is defined by the Brazilian Dyslexia Association in the same international line, being this: Developmental dyslexia is considered a specific learning disorder of neurobiological origin, characterized by difficulty in precise and / or fluent word recognition, in the ability to decode and in spelling. These difficulties usually result from a deficit in the phonological component of language and are unexpected in relation to age and other cognitive abilities. (BRAZILIAN DISLEXIA ASSOCIATION, 2016). To know the student and treat him naturally, using objective language and checking, with discretion, the understanding of what was proposed; are suggestions that generally favor the teacher-student and teaching-learning relationship (ABD, 2016). As for physical disability, it can be defined as: "complications that lead to the limitation of mobility and general coordination, and may also affect speech to different degrees" (NOVA ESCOLA, 2018).

Most of the time these students take advantage of technological resources or assistive technology. Since some may have difficulty speaking, the family and school may seek help from other professionals. It is necessary that teachers exchange information about the student's progress and adapt the activities when necessary (NOVA ESCOLA, 2006).

Students with intellectual disabilities have different learning rhythms. However they should not be confused with students with mental disorders, which is another category of people who suffer severe impairments in cognitive or behavioral aspects. Since each student will have his or her own pace of learning, in general syllabuses it is indicated that the teacher "try to give it a relatively easy activity, and gradually increase the difficulty. If the student is unable to perform the exercises, the teacher should return to lessons easier, until the student feels ready for new challenges" (ESCOLAWEB, 2016). As for people with deafness, they have a hearing impairment; however they can learn a lot through vision and also using the Brazilian Sign Language, LIBRAS (BRASIL, 2005). This is a different language from Portuguese. While the former is articulated and perceived by hands and vision; the second is projected vocalized and is perceived by hearing. A priori, the condition of deafness does not offer intellectual commitment. The communication will be through a different language than the teacher usually uses. The student public with deafness accesses enough resources associated with video, video call, images, drawings and games with instigating visual interface. To increase access to information, the service of the translator and interpreter of LIBRAS / Portuguese Language (CAETANO and LACERDA, 2013) is relevant. Concerning autism, it is "a condition that severely compromises the ability to communicate with others, to perceive shared events, to express what they feel or think in the most diverse situations" (ENTENDENDO O AUTISMO, 2015). Each student with autism has different potentialities for learning, "intelligence can vary from subnormal to above normal" (MINETTO and FAICON, 2010, p.160).

MATERIALS AND METHODS

We understand by methodology the path of thought and practice exercised in the approach to reality. In this sense, the methodology occupies an important place to base the theories. For this reason, we selected the qualitative approach as a model for structuring the research. This type of method provides the most accurate perception of the intrinsic information and the complexity of the relationships existing in the educational context. Since education is a social object of great complexity, which deals with variables in all its processes, the qualitative research proposes to meet the needs of the researcher. Goldenberg (2000, p. 17) explains that "researchers adopting the qualitative approach in research oppose the assumption that a single research model for all sciences is based on the model of the study of the natural sciences." This opposition is demanded by the very genesis of the study: experiments, quantitative analyzes indicate arithmetic results; while complex human processes such as the educational ones are more useful when they find situations that provide contextualized data that will help the reader as to whether or not to comply or improve the procedures revealed by the research. With the purpose of exploring the theme, we chose structured interviews as one of the investigative resources. In this stage, five collaborators were made available to provide information requested by the researcher - two

teachers from the private network and three students from the PIBID¹ program who will be referenced by the term Scholarship followed by a number. Another mechanism used was two observations; conducted in a non-participant and free way - one of which occurred in a private network school and another in a public institution. All schools are of Senhor do Bonfim. We use the resources of interviews and observations because this "multiplicity of resources" constitute "decisive instruments for studying the processes and products in which the qualitative researcher is interested" (TRIVIÑOS, 1987, p. In this perspective, we aim to offer, more clearly, data regarding the mediation that teachers perform with students who have specific educational needs, during the use of computer labs.

The information from contributors: Being aware of the difficulties in the school in which he / she works, causes the teacher or trainee to awaken to the existing challenges and employ efforts for a pedagogical practice to be more inclusive. In order to capture the impressions of the teachers about their work in offering classes also in the computer lab, a questionnaire with closed and open questions was delivered according to the research objective. In the sequence the questions were described and we then recorded the answers in italics.

The first question asked was: How useful is the computer in your classes? Next we list two of the answers, consensual, and then we comment.

"It is of great value, not only here, but in all schools, whether it be basic education or higher education" (Professor 1). "The use of the computer in the classroom is a great facilitator, because it assists in the student's understanding and learning in the pedagogical activities worked in the classroom" (Teacher 2).

It is emphasized here the importance of the computer for the teaching-learning process, since it can have contributions to exercise what had been worked in the classroom.

The second question seeks the following information: which programs are being used?

"Always start with the basic tools: Word, Paint, Power Point, Internet search and search sites, etc. After that, I always insert what modules require in relation to student learning" (Teacher 1).

"Games Games applications are used which is a program that contains several educational games with pedagogical accompaniment in which children learn playing, as well as Paint" (Teacher 2). "Well, here in Pibid we use the Linux application, which is an application with hundreds of games geared towards education, pedagogical games directed at various school levels, that is, from the simple to the most complex" (Scholarship 1). "G-compris, Thux Match, Text Editor, Libre Office package write, all very good for facilitating the fixing of the given subject in the classroom" (Scholarship 2).

Through the above, we infer that these programs contribute to stimulate cognitive activities in writing practice, curiosity in

¹Institutional Scholarship Program.

searching the Internet for something to add in their knowledge and learning, visual design through artistic creation and presentations through tools available on the computer. We try to understand if there is an interdisciplinary connection when using the computer. The following employees report:

"Yes. The modules here (teaching material) are very advanced, I have to be prepared for the most diverse contents" (Professor 1).

"Yes. We use interdisciplinarity as a recurring factor, we always seek to correlate the contents, mainly in practice, thus facilitating the learning of those involved. Thus, children not only fix content but also learn to manipulate the computer" (Teacher 2).

"Yes, we use the games on top of what is being applied by the teacher, we create this intertextuality [interdisciplinarity] because it is very important that we do this segment of teaching, we look for games compatible with the disciplines given in the classroom to let the student set better, learn jokingly" (Scholarship 1).

"Always, teachers of other disciplines like English and Chemistry ask for help to develop activities using the computer lab" (Scholarship 2).

Commenting on the interlocutions of the interviewees, in the case of teacher 1, there is a relationship between the textbook to exercise such interdisciplinary mechanism. Through the computer the student can produce texts (Writing), create forms (Mathematics), search contents about the past and the present (History), its location (Geography), organize a presentation through Power Point for a discipline, among others. Scholars have made clear the connection between the demands of the classroom complemented in the computer classes in the laboratory. That is, the computer is an interdisciplinary tool, since its software can be directed to a theme (teaching area), making the activities of the other disciplines more attractive and dynamic. For this, it is necessary to create learning environments that favor the construction of the person's knowledge (VALENTE, 1991). The next questions of the interview approach the learning relationships in the agenda of inclusive education. Here's the question: Among the classes you teach, are there special students and how is it included?

"We have: students with attention deficit, learning disabilities, dyslexics, physically and mentally handicapped. We do group work and I try to adapt to every need" (Professor 1).

"Yes. We have two students with autism, but this factor does not disturb them in the practice of the discipline of Informatics ... For everyone is worked the same content in the classroom with the objective of all help each other; all participate in forming a unique team. We try to develop motivational and fun exercises so that the child who has difficulty interacting and communicating wants to interact with us" (Teacher 2).

"Yes deaf, but this does not interfere with the development of computer classes, they question the interpreters and we try to pass the subjects more clearly into them" (Scholarship 3).

By filtering what was expressed in the interviews, we realized that teachers use strategies that contribute to pedagogical achievement, as is the case for stimulating group work (SONZA, FÉO, PAGANI, 2013). One of the teachers mentioned that he does "adaptation." This is a further development of the teaching activity, it is desirable and often effective because it broadens the student's access. Making small adaptations is a legally based action and positive educational effects (BRASIL, 1996). We recognize that in the case of adaptations, the creativity of the teacher is a requisite competence in situations that demand solutions. The creative ability of the teacher can result in "small variations [which] may favor a greater involvement of the student with certain content" (MINETTO and STIVAL, 2010, p.69). In this context, computers are tools that allow teachers to organize pedagogical moments with students using technology. Using the computer in the room offers a range of tools that stimulates learning and acquiring new knowledge. At the same time, let us reflect again on the daily and the teaching strategies. The practical word came from the word "praxis" which means, according to Ferreira (2001), "what is practiced habitually, routine use, action, exercise." With regard to the conceptualization of pedagogical practice, it must be understood, according to ERUM apud REIS 2004, p.63, "... any articulation made by the teacher between the know-how and the local reality as a means or path to fulfill, or practice a pedagogical proposal ". We note that the information given is indicative of the teachers' reflections, however, we use the observation in two cases in order to extract more detailed examples related to the practice of mediation.

Observing Interaction for Mediation: We did a day of free observation in two institutions of basic education. The first was at the fundamental level and the other at technical level. Following is the data that has been recorded in writing in the Word program, and will follow the relevant analysis.

In the first institution, we observed the day 23 of February of 2018 in the morning shift. The following is the observation report:

"In this day the activity was of the discipline of Sciences and the educational software chosen for the students was School Games also attending the age group of the same with the game Domestic Animals, thus reinforcing what they had studied in the classroom. The game was a very entertaining jigsaw puzzle in which the animals were with various parts of other animals, in this case the goal was for the students to choose one of the figures they wanted to set to complete the animal and with the mouse was clicking on the different parts until form the chosen animal completely.

Before, the teacher put the little game on the big screen and asking the attention of all explained carefully how everyone should do, stressing that after completing the action the pair would have to identify the animal and say what it fed to all present, and that first one would do it and then give it to his colleague. When students encountered difficulties in identifying the animals, they called the approaching teacher and gave several tips until they could get it right. When they completed everyone clapped and then it was a contagious joy. Among the class, a student with specific needs, was the one who requested the least help from the teacher, coming to consult him only once during the class period.

Table 1. Synthesis relating specific educational needs and mediation in the researched context

Specific Educational Needs	Mediation indicated	Technologies used in the laboratory.	Mediation occurred
Student with Attention Deficit Disorder.	Motivational dynamics and audiovisual stimuli. (NEUROSABER, 2016)	Word, powerpoint, search sites and module directions.	Groupwork
Student with dyslexia	Know the student, be objective and discreet. (ABD, 2016)	Word, powerpoint, search sites and module directions.	Groupwork
Student with physical disability	Use technological or assistive technology resources; or make other adjustments to the student. (NOVA ESCOLA, 2006)	Word, powerpoint, search sites and module directions.	Groupwork
Student with intellectual disability	Same curriculum, but with activities that the student can take care of.	Word, powerpoint, search sites and module directions.	Groupwork
Students with deafness	Explore pictures, drawings, videos and tutorials. Communication in LIBRAS (Brazilian Sign Language). (CAETANO e LACERDA, 2013).	G-compris; Thux match; Visual Studio.	Approach of the student using some signs or gestures; Use of the screens showing the code; Repetition; Translation of the communication through the translator and interpreter of LIBRAS / Portuguese.
Autism	Find out which compliments or activities are pleasurable and provide good routine.	Escola Games	Activity in pairs; motivating exercises.

Font: Prepared by the authors, 2018.

It is observed that hardly anyone who was not informed, would perceive that some student had moderate autism. After the student was convinced by the teacher to share the computer, in front of the activity to be developed he becomes smiling, talkative and very considerate in handling the mouse and the keyboard when necessary, even helping his colleague on the side”.

On this episode we can infer that the choice of activity was appropriate and thought-provoking. The teacher mediated the process from the first explanation until when the students wanted to clarify some doubt. It was possible to realize that for the student with autism no further explanations were needed, he was able to develop the activity and even help the colleague. We realize that a good mediation, through the good planning, training and availability of the teacher. The results tend to be advantageous, as in the case observed the student was autonomous and also interacted. At this point the second observation will be exposed. In order to analyze another reality and once again the relationship between computer use and teacher mediation. We report here the observation made on 02/27/2018, in the 3rd technical module in computer science of the programming discipline II. The class consists of 09 students, between these two deaf. The class takes place in the computer lab that contains 24 computers, very well distributed in a large room and heated. The following:

“It is noted among the class that two of the students present have specific needs are deaf, but both are very well supported, because they have an interpreter present in the class to give them the support when necessary, communicating through sign language. The class is taught by the Teacher who is working with the Visual Studio Program² in the use of the C # language in program creation. It is observed that it is not an easy subject to absorb since programming is one of the most complex languages. Consequently, all students had a degree of difficulty common to the subject worked and with the deaf students was no different. And it was at this moment that the teacher sought help in the interpreter present, reinforcing the explanations with some repetitions until they understood and

performed what was being asked, already on the mouse and the keyboard used to dominate its functionalities. Sometimes the teacher made some sign in LIBRAS or used gestures that the students understood. On this day the activity proposed by the teacher so that all the students execute in their machines would be the implementation of the components manipulated by code using the graphical environment. Making use of the digital whiteboard to display the screens. During the execution of the task, it was evident that the deaf student A was easier to follow the class and did the activity practically alone without seeking help, completing the task successfully, that is, he liked to feel independent and did not seek help from the interpreter. As for the deaf student B, he had some difficulty in following the instructions of the teacher, thus resorting to the interpreter who calmly passed on what the teacher directed him, so that the teacher could carry out the task, but the same within the time limit of class could only conclude 50% of the activity. When asked by the students that they were unable to develop the task successfully, the teacher would go to the teacher's computer, drawing attention and pointing to the possible error, and as mentioned above the teacher explained to the interpreter present, very calmly and several times for the interpreter to understand and pass on to the students, so that they could continue the activity. That is, for the class to perform well in that exercise, the teacher used both the computer to show where the error was, and also his didactic ability explaining the subject many times for all”.

We observed encouraging elements regarding the episode described. Although the content was highly complex, the teacher used strategies that were within his reach. For example, the teacher used elements in the student's own screen to solve the doubts. In addition, it explained several times until the student could understand and put the code. The visual elements contained in the task must really be pointed out and clarified. Exploring visual elements well is a skill that favors the learning of deaf students. Elucidating the importance of visual elements, authors Caetano and Lacerda explain that: "today, the visual resources are broad from the most accessible media such as television (present in virtually every home) to the innumerable possibilities of image and composition of virtual spaces provided by the computerized world. "They

²C Sharp, or C #, is a heavily typed, object-oriented Microsoft programming language that is part of the .NET platform. Its syntax was based on C ++.

further add that" deaf students are immersed in the visual world and learn from it most of the information for the construction of their knowledge "(CAETANO and LACERDA, page 186). Exploring visual potential broadens access to understanding. Another advantage of making explicit the visual elements is that it contributes to a translation more visually aligned with the content. Favoring good interpretation and building a good partnership with the Sign Language translator and interpreter also improves the quality of mediation that the teacher intends to accomplish. We realize that when the student requests, the teacher approaches and shows or explains in what he or she should improve. In addition, he has made use of repetitions as many times as necessary, so that the student understands and continues. It was possible to perceive that the teacher uses all his abilities to provide the understanding. In addition, he seeks to learn some signs to communicate some concepts. This initiative is important to "assist the deaf student in understanding the contents (CAETANO and LACERDA, 2013, p191). Even though the LIBRAS Translator and Interpreter service is widely used, the teacher approaches the student more by taking the initiative to learn and use some signs or gestures with the student in order to communicate more fully.

Other considerations necessary: The inclusive process can be contradictory, this research does not focus on the failures of this process that can generate a "pseudoinclusion" (MINETTO, 2010, p.243). Here we have a consensual reflection that should guide administrations and the attitude of the school itself: we must invest in teachers and their education. Good professionals measure learning very well with new technologies in the classroom or in computer labs. We now emphasize the need to think about teacher education as a decisive element to act in the face of diversity and to make the inclusion process effective, since the school needs to be attentive to reflections about the use of computers as collaborative learning instruments. In this perspective, the use of Information Technology in Education teaching methodology contributes to advancing the paradigm of social inclusion, seeking to intercept educational and socio-cultural practices that divide groups in a prejudiced way. Schooling is one of the relevant points to promote socialization and approximation among different social groups and, in this same line of action, the computer becomes a viable means for such actions. In this research we also perceive some potentialities manifested by students and educators. We will therefore offer a summary in the following table to make it clear that mediation for the public with specific educational needs is productive. For Oliveira (2000), pedagogical practice is a complex and dynamic activity that takes place in a particular social environment, formally responsible for the student's education. To meet today's demand, mediation should enable the formation of a critical citizen, capable of dealing, consciously, with the scientific and technological reality that is inserted. We noticed that teachers showed efforts to ensure more access and learning.

Final Considerations

From the theoretical survey and qualitative analysis leveraged in this research, the collaborators stated that more and more the continuous formation of the teachers, including the computer science, is essential. We perceive that the teachers' position contributes to the transition between the mediation of knowledge and the digital inclusion of students with specific

educational needs. We have achieved the goal of researching how teachers mediate with students with specific needs. We find that they use planning, creativity, visual resources and digital means via computer. Besides these factors they measured through explanations, giving attention and taking doubts. We point to continuing education as a path that can awaken teachers to more technologically savvy skills and, combined with field needs, teachers can demand for more media, programs, applications; in short, technological resources that are closer to the pedagogical needs of learners. These demands for new media and training still leave room for both production and research of applications in education. We note the mediation of basic activities that result in educational significance, either in the interdisciplinary or in the cognitive development. Certainly, computer teachers are committed to providing a more democratic education that addresses the challenges and attempts to ensure intellectual and inclusive growth.

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