pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

ARTIGOS

Distance collaborative consultation in assistive technology for teachers: planning, implementation, and evaluation of a case study[1] [2]

Consultoria colaborativa a distância em tecnologia assistiva para professoras: planejamento, implementação e avaliação de um caso

David dos Santos Calheiros (i)

Enicéia Gonçalves Mendes (ii)

Gerusa Ferreira Lourenço (iii)

Adriana Garcia Gonçalves (iv)

Mariana Gurian Manzini (v)

(i) Universidade Estadual de Ciências da Saúde de Alagoas – UNCISAL, Maceió, AL, Brasil, https://orcid.org/0000-0002-4761-5569, david_calheiros@yahoo.com

(ii) Universidade Federal de São Carlos – UFScar, São Carlos, SP, Brasil, https://orcid.org/0000-0003-3673-0681, eniceia.mendes@gmail.com

(iii) Universidade Federal de São Carlos – UFScar, São Carlos, SP, Brasil, https://orcid.org/0000-0002-7550-4858, gerusalourenco@gmail.com

(iv) Universidade Federal de São Carlos – UFScar, São Carlos, SP, Brasil, https://orcid.org/0000-0002-5725-2001, adrigarcia33@yahoo.com.br

(v) Universidade Federal de São Carlos – UFScar, São Carlos, SP, Brasil, https://orcid.org/0000-0002-9126-7514, mariana_gurian@yahoo.com.br

[1] Support: Research Support Foundation of the State of São Paulo (FAPESP).

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001

[2] English version: Deirdre Giraldo - deegiraldo@gmail.com.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

Abstract: The aim of this research was to plan, implement, and evaluate a distance collaborative consulting service in Assistive Technology (AT) for two teachers at the multifunctional resource room. This was a qualitative approach case-study, Three AT consultants also participated in the study in addition to the teachers. Data was collected by means of activities organized in the virtual learning environment and questionnaires. Initially, the data identified a demand for the teachers' knowledge about AT. Next, the teachers chose a case of a student with cerebral palsy to receive support from the consultants. Finally, there was the evaluation of the service. The data were analyzed using a content analysis technique. The findings indicated that it is possible to identify the demands of the teachers regarding the use of AT at a distance, as well as to plan and implement collaborative consulting efforts. The contribution of this research is to indicate an alternative possibility for school support.
Keywords: special education, assistive technology, virtual learning environment, cerebral palsy

Resumo: *O objetivo desta pesquisa foi planejar, implementar e avaliar um serviço de consultoria colaborativa a distância em Tecnologia Assistiva (TA), para uma dupla de professoras. O estudo desenvolvido na abordagem qualitativa foi do tipo estudo de caso. Participaram também três consultoras da área de TA. Os dados foram coletados por meio de atividades realizadas em um ambiente virtual de aprendizagem e de questionários. Inicialmente, foi identificada a demanda por conhecimentos de TA das professoras. Em seguida, as professoras escolheram um caso de um estudante com paralisia cerebral para receber um suporte das consultoras. Por fim, ocorreu a avaliação do serviço. Os dados foram tratados através da análise de conteúdo. Os resultados indicaram ser possível identificar as demandas das professoras em relação a TA, bem como planejar e implementar ações de consultoria colaborativa a distância. A contribuição desta investigação consiste em indicar mais uma possibilidade de serviço de apoio à escola.*
Palavras-chave: *educação especial, tecnologia assistiva, ambiente virtual de aprendizagem, paralisia cerebral*

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

1 - Introduction

In recent years, the Ministry of Education (MEC) has made Assistive Technology (AT) resources available to Brazilian public schools, aimed at supporting the schooling of the Special Education target group students. AT is understood as all the resources and equipment that provide people with disabilities or reduced mobility greater functionality in carrying out daily activities, from inherent actions to daily self-care, or even involved in labor contexts (U.S. Government, 2004). The definition still covers services related to the development and prescription process of these technological solutions. Such services should be provided by an interdisciplinary team, since AT is considered an area of knowledge and encompasses correlated aspects of health, education and technology. Specifically regarding the stages of schooling, TA becomes essential for guaranteeing the participation and development of students with disabilities, by allowing them greater access to the curriculum.

In spite of the incentive coming from national agencies, which can be verified through the Accessible School Program proposals (Brazil, 2013) and the Multifunctional Resource Room Implementation Program (Decree: BR, 2011), which have helped the insertion of some of these resources in schools, the access to and application of AT is not as simple as it seems.

In the case of the Accessible School Program, the possibility is open to the school to request AT resources for the educational process of students with disabilities in the school environment. However, there is no specification regarding which professionals or teams of professionals would define and implement this support service, which demands specific knowledge and skills.

With regard to the Multifunctional Resource Room Implantation Program, there is a definition of a resource *kit* and a professional would be in charge of this function, which would be the specialized teacher. However, this professional has demonstrated difficulties in implementing these AT resources in their work practices, and which, most of the time, is justified by the lack of specialized training in the area. This assertion can be verified in several surveys carried out in different places in the country (Dounis, 2013, Lourenço, 2012, Manzini, 2011).

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

According to Galvão Filho (2011), professionals in the educational area have been demanding better educational training in terms of support and help to implement TA resources, more and more. This concern stems from the fact that AT is in many cases fundamental and indispensable to advance the education of the target audience of Special Education in the common classroom, especially for those students with serious functional impairments. Hence, the importance of the teacher, who works at any level and modality of teaching, to undertake the knowledge related to the AT area in order to help the student to participate in the school space.

One of the service rendering models in the area of Special Education, which has emerged as being promising in the AT area, is collaborative consulting (Hummel, 2012; Pelosi, 2008). This model is known for its excellence in collaborative work between educators and specialists (occupational therapists, physiotherapists, speech therapists, psychologists, among others). According to the principles of collaborative consulting, teachers should no longer work alone but, whenever necessary, in teams made up of a group of specialized people whose principle is mutual support and shared responsibility.

Collaborative consulting requires the establishment of an egalitarian relationship from the partners involved, in which each component's experiences and professional knowledge is appreciated without, however, creating a hierarchical relationship that overvalues individual knowledge and skills. This relationship allows the partners involved in the consulting process to determine common work objectives and to strive to solve them together. In this perspective, the teacher ceases to be the sole person responsible for the process of schooling of the target audience students of special education, and to voluntarily share this assignment with another professional (Correia, 2013).

National studies on the school collaborative consulting model of psychologists (Pereira, 2009; Silva, 2010), occupational therapists (Assis, 2013; Lourenço, 2012) and other professionals of the multidisciplinary team (Mendes, Almeida, & Toyoda, 2011; Vilaronga, Mendes, & Zerbato, 2016) have been effective in solving problems such as promoting the participation and learning of students with disabilities, as well as providing continued educational training for all those involved in school inclusion practices.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

Traditionally, collaborative consulting services have been carried out in person and have achieved positive results (Mendes et al., 2011). In the case of AT consultancies, the results indicate that teachers take control the AT resources and begin to use them in the school routine with their students, under the supervision/collaboration of a specialist (Lourenço, 2012). However, what is also noticed is that teachers find it difficult to continue the use of these resources when support services and training cease.

Based on this, what can be understood is that the teacher needs permanent support from specialists in the area of AT, with the aim of instigating and ensuring the uninterrupted use of these resources on a daily basis at school (Lourenço, 2012). However, in terms of Brazilian reality, the number of professionals specialized in the area of AT is insufficient to meet the demands of teachers working in the basic education system (Pena, Rosolém, & Alpino, 2008; Silva, 2007).

In this high demand context for technology resource implementation services and also due to the lack of qualified professionals in the area, the distance modality presents itself as a timely space for the development of a collaborative AT consulting service, as it enables specialists to advise a larger teacher contingency providing both service rendering and professional educational training.

Thus, considering the fact that the teacher needs permanent support in the AT area and that the number of specialized professionals for this support is still limited, it is believed that distance education resources and tools can contribute towards socializing knowledge, favoring the education of the target audience of Special Education and also contribute to the human resource training in the AT area. The study reported herein is part of a larger research that aimed to plan, implement and evaluate a distance collaborative consulting service in AT (Calheiros & Mendes, 2016). The methodological approach and the results of the intervention performed by a pair of multifunctional resource classroom (MRC) teachers, specifically for this report, will be presented based on their demands.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

2 - Methodological aspects

Therefore, this work is about a case study (André, 1984), based on a qualitative and exploratory research (Sampieri, Collado, & Lúcio, 2013). The case-study research aims to analyze specific reality in a natural situation (Lüdke & André, 1986), where a pair of MRC teachers are offered collaborative consultation.

2.1 - Participants

A pair of teachers who worked in MRC, belonging to the Department of Education in the city of Rio Claro, São Paulo, Brazil, took part in the research. The teachers had training in Pedagogy and *lato sensu* post-graduation in the Special Education area. Also participating in the study were three consultants in the area of AT, two of them with initial educational training in Occupational Therapy, and the third, graduated in Physiotherapy and Pedagogy with special education qualification in the area of Physical Disability. All of them had *stricto sensu* post-graduation in the areas of Education/Special Education, where two of them had PhDs and one was in the process of getting it. The selection of teachers and consultants was based on the criterion of non-probabilistic intentional type sampling. The Free and Informed Consent Form was signed by all the study participants.

2.2 - Research environment

The AT distance collaborative consulting service took place on the Moodle platform, a Virtual Learning Environment (VLE), which was adapted to the characteristics of this research and which counted on communication/collaboration tools between the teachers and the consultants, aiming to guarantee the use of the resources in the process of school inclusion. The investigation also counted on the advice of an instructional designer, responsible for developing the VLE and solving the technical problems related to this environment.

Once the VLE was developed, it was denominated "ATC", the acronym for the term AssistiveTecConsul, and its content was validated by judges – researchers in the area of

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

Special Education and Computing. The judges evaluated the environmental suitability for the proposed objective; the design; the illustrations; and the availability of the tools. Among the available tools were the ones which allowed synchronous (simultaneous) or asynchronous communication (that occurs at different times), such as: resources and links to files or websites, tasks, chats, forums, profiles, electronic mail, among others.

The participants, after agreeing to participate in the survey, received the link to access and navigate the ATC environment from their own computers in their electronic addresses. A subtitled video tutorial was available in the ATC environment to help consultants and teachers navigate and use the tools. In this way, the participants could, at any moment, visualize the tutorial, which was available for consultation in the ATC environment itself. In addition, both the researcher and the instructional designer could be consulted to solve the emerging queries. The environment was created to be intuitive and self-instructive for participants, requiring no prior training.

Regarding the tools available, the most used in the consulting service was the forum, which allowed the participants to express themselves without the other members of the discussion needing to be online at the same time. This tool specifically allowed the participants to follow the discussion in question in the environment, as well as to express their opinions with care and reflection.

In general terms, the ATC environment made it possible for teachers to report their requests regarding the use of AT, providing moments of interaction between them and the consultants – through the intervention of the researcher assisting in the use of AT – and to follow the guidance application process of the teachers. The consultants provided feedback on these applications and, finally, the ATC environment allowed the participants to evaluate the service offered. Further information on the development of the ATC environment, with details on its organization and operation, and the evaluation of this VLE, regarding its limits and its possibilities to support the use of AT resources by teachers of students with cerebral palsy (CP), can be verified in the study of Calheiros, Mendes and Mendonza (2016).

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

2.3 - Data collection instruments

In order to carry out this research, two data collection instruments, which had been developed for the study and validated by judges, who were researchers from Special Education areas and AT, were used:

• Case Demand for Assistive Technology Distance Collaborative Consulting Questionnaire (DCC-AT):

The DCC-AT is self-administered, with open and closed questions and was incorporated into the Environment with the purpose of knowing the difficulties that the MRC teachers had in relation to the use of AT in the schooling of their students with CP, as well as the possibility of running a Distance Collaborative Consulting Service in AT. The filling out of the DCC-AT was a requirement for the beginning of the intervention process. Responses were inserted into the ATC environment, serving as data and these reports were analyzed using the content analysis technique.

• Final Evaluation for the Distance Assisted Technology Collaborative Consulting Service (FECC) Questionnaire:

The FECC, similar to the previous questionnaire, is self-administered - it presents open and closed questions, and its main purpose is to evaluate the limits and possibilities of the Distance Collaborative Consulting service in AT. It was incorporated into the ATC Environment, to be answered by the participants of the research. The data were also handled using the technique of content analysis.

2.4 - Data collection procedures

Several steps were involved in the outline. Initially the DCC-AT Questionnaire was applied in order to identify the demand by the teacher pair for AT knowledge and the possibility of collaborative consultation. The selection of the case of a student with CP, who

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

required the use of AT resources was also a requirement made by the teacher pair, for the case to be studied during the consultation. To help the consultants understand the case, the teacher pair should present the needs of this student and using videos and photos, register entries to be posted in the ATC environment.

The case was analyzed by the three consultants, who offered suggestions on the indication of AT resources and forms of implementation in the school routine. These suggestions were analyzed by the teacher pair, who, together with the consultants, evaluated and defined which recommendations to carry out.

The teacher pair implemented the agreed recommendations and recorded this intervention using reports and filming, and posted them on the ATC environment. The consultants provided feedback to the teacher pair throughout the intervention process on the implementation process, and this dialogue/collaboration was mediated by this study`s principal investigator.

At the end of the eighth-month intervention, the FECC Questionnaire was applied, with the intention of evaluating the procedures of the service rendered.

2.5 - Data analysis

All the data recorded in the ATC environment about the case, which comprised the interactions between consultants, the teacher pair and the answers to the instruments, were dealt with through the technique of content analysis, specifically the thematic analysis (Bardin, 2011). Thus, three procedures were used to deal with the data, namely: a) free floating reading of the collected materials; b) selection of the units of analysis based on thematic criteria; c) classification process.

2.6 - Ethical aspects

It should be noted that the research was approved by the Research Ethics Committee (CEP), based on protocol: 349.028/2013, and diligently followed the ethical principles of Resolution 466/2012 (Resolution Br, 2012).

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

3 - Results and discussion

The data analysis and interpretation process resulted in the setting up of four thematic categories, developed later on and that were used for result organization and presentation, namely:

- Demands regarding the use of AT.
- Planning of distance collaborative consulting procedures in AT.
- Implementation of consultation procedures.
- Evaluation of the proposed service.

3.1 - Demands of the teacher pair in relation to AT use

The pair mentioned that they had difficulty using AT in their professional practice, and these teachers selected the case of Flávio[3], an 8-year-old student enrolled in Early Childhood Education (Table 1). They completed the DCC-AT Questionnaire and submitted a video of the student performing academic activities.

Current Student Characteristics	
Short profile of the student	-A happy, quiet child, who needs a great deal of stimuli and adaptations for his development. He does not make use of any resources such as: glasses, braces, hearing aids, etc.
Visual capacity	- No visual deficit diagnosed; - he can follow an object with his eyes and fix his eyes on a stationary object; - he cannot look to the right nor to the left without moving his head; - he can look up and down without moving his head.
Hearing capacity	- No hearing deficit diagnosed; - he can react when called, or is scared by a loud sound; - he understands what is said to him (understands that it is he who is being spoken to).
Social behavior, cognition interaction	- He does not stay alert throughout the school period (he wants to look at everything at the same time, but if you are talking to him and something happens, his attention disperses); - he maintains interest for about 15 minutes in an activity that is proposed to him. The repetition of activities is always carried out. The moment we

[3] This is a fictitious name, used to safeguard the participant's identity.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

	realize that the child's attention has dispersed, we stop, offer water, talk a little bit and then resume the activity again; - It is not clear if the student understands and follows concepts of direction, but if offered some stimulus, such as a rattle, for example the student directs his gaze; - he does not choose between two options given to him; - he likes music; games, computer software, activities in front of the mirror, activities with water, paintings with water colors, puppets, toys with lights/sounds; - he is cheerful, smiling, very calm.
Motor capacity and positioning	- He presents motor control of the following body parts: eyes, neck, left hand, right hand; - in many activities he uses both hands to reach an object, sometimes he takes it to the right and sometimes he changes taking it to the left; - in some activities he makes use of the positioning pants, in others, he plays on the floor with toys for example, sits Indian style, but needs help to control his trunk; - he presents intentional movements; - he does not sit without support. He usually needs: positioning pants; Indian style with support from someone to control his trunk; - he remains seated in a wheelchair, to carry out the activities in the room and to access the computer; - He raises his right buttock very often. When the child gets out of the wheelchair his legs cross, his hands are tightly closed, his tongue remains constantly out of his mouth.
Communicative skills	-He emits sounds to communicate. Only people who know him understand; - he uses alternative forms of communication. Work with YES and NO cards with the student started this year, but he still does not understand the meanings, because as yet no response has been obtained

Graph 1 – General information about the student (Flávio), provided by DCC-AT
Source: DDC-AT Questionnaire (2015)

The reason that the teachers chose the case of this student (Flávio) was the result of their uncertainties about how to properly use the AT resources in the educational context, how to know when to introduce them and if the resources implemented (Alternative Communication - use of "Yes" and "No" cards) would be the most appropriate according to the potentialities, limitations and needs of the student. This type of specific demand reinforces the evidence pointed out by national authors about the importance of providing support or training in AT to education systems in order for there to be more effective practices and teacher training (Lourenço, 2012; Mendes & Lourenço, 2012).

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

Despite the lack of specialized knowledge and of a support service, the teacher pair mentioned that, even before the start of the consultation service, they had been trying to solve the problem of the case in question and the strategies/activities used were as follows:

> Stimulation activities, by means of mirrors, music, computers (sound and visual), etc. In addition to these activities, I started working with the alternative communication, using two "Yes" and "No" cards, but I have not had any answer so far. In the classroom [the student] carries out activities inside and outside with the group, for example: in the park he uses the adapted swing, in the sand pit he uses the positioning pants or sits between the legs of the monitor, in the physical education activities when the teacher plays with the children so that they need to run, the student "runs" [emphasis on the original] in his wheelchair, at other times he is sitting on the floor with the other classmates. (Source: ATC Environment)

However, as the teacher pair reported in the DCC-AT Questionnaire, all these strategies/activities were based on research, reading, guidance/reflections carried out with the school coordinator (Manzini & Deliberato, 2007). One of these activities, for example, the alternative communication (introduction of "yes" and "no" cards) was filmed and sent along with this report to the consultants to make their respective analyses, since it was considered a challenge for the teachers who were part of the pair.

Summarizing, the activity filmed showed a scene in which the teachers asked the student (Flávio) if he wanted to play. The boy should respond: yes or no, using two cards that were arranged on his legs. The consultants considered this strategy/activity of alternative communication positive, although they later suggested changes. See the comment of one of them in the following fragment:

> I would like to congratulate the duo on the initiative of using alternative communication resources. By means of the video, I noticed that the pictographic figures are adequate in size for the visualization of the child. I was able to visualize that the teacher does not ask the child mechanically. She asks the question and waits for a communication from the child, that is, the teacher gives the child an opportunity to express his wishes. (Consultant 1 - Source: ATC Environment)

In this way, the consultants, together with the teacher pair, decided that they would maintain/enhance the use of this strategy as a proposal for the collaborative consultation service and would next evaluate the success or lack of it in the implementation process, as they felt that alternative communication can favor the student's (Flávio's) schooling process (Deliberato, 2011; Rocha, Deliberato & Araújo, 2015).

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

3.2 - Planning of distance collaborative consulting procedures in AT

After the teacher pair needs were identified, the three research consultants examined and discussed (in a collaborative way) the student's (Flávio's) case, in order to select the strategies that could contribute in a more effective way to solve the problems identified. This process occurred remotely, using the tools available in the ATC research environment. In Figure 1, it can be seen in its entirety how this step of planning procedures and interventions occurred.

Consultant 3	Consultant 2	Consultant 1
I noticed that the pictographic figures are the right size for the child to visualize. The teacher does not ask the child mechanically. She asks the question and waits for communication from the child, giving him the opportunity to express his wishes. I consider it important for the teacher to talk to the child's mother or relative to understand how the child's communication is at home. My suggestions are: - the teacher should start with just one pictographic figure. A new procedure with simultaneous stimuli may confuse the child. - to implement the figure, first, the teacher needs to use a concrete object (show their goals, stimuli), then take a picture of that object and make the relation between concrete object and photo. Finally, you must insert a more abstract figure. Thus, the child will be able to relate the figure to its corresponding object. At this stage, it is important to use toys/objects from the child's center of interest.	The advice from consultant number 3 was perfect. I suggest an inclined plane. The information must be available within the child's visual field so that there is no loss of energy in moving his head to see the cards on his lap. Using a table with a the semi-circle (crescent shape) cutout to ensure a better positioning of the upper limbs, using his elbows and the entire forearm supported on the table to help bimanual activities and trunk positioning. The waiting time for a response is extremely important, and the teacher does this correctly, but it is important to emphasize the same activity several times for the learning to take effect. Carrying out activities with the computer (since it is an existing practice. As he moves the mouse, perhaps the roller-mouse is an easier alternative). And then the teacher can set up figure recognition and sound association activities.	Hi guys, I also agree with your suggestions. I value the intention to answer between yes and no ..., but we may also think that instead of two choices, she can try to find some gesture with the student that can be used for affirmative answers and negative answers, and keep the symbol representing objects. She could see if he could use the sound he emits for a yes, for example, and try a no with a head gesture as he can make these moves. One suggestion is also the use of activities in Power Point to keep the student interested in the computer. You could associate the training with the images of the real objects for the activities on the computer, using the mouse click or even the keyboard so the student can show these images.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

Secondly, the teacher should teach the child how to act to express their opinion. The teacher can use: 1) physical assistance: the teacher takes the child's arm and helps him to pick up or point at the figure; 2) model: the teacher shows how the motor action must be performed, in other words, looks at the object, extends his/her arm and points or opens his/her hand to pick up the object; 3) verbal assistance: the teacher gives verbal cues to help the child pick up or point at the figure. When the child picks up or points at the desired figure, the teacher shows the concrete object that is related to the response and hands it to the child. What do you think?		

Figure 1 – Consultant collaboration on the case of the teacher pair

Source: ATC Environment (2015)

As shown in Figure 1, all the research consultants presented their suggestions for implementations in the students' (Flávio's) case, which summarizing, were:

- Talk to the child's mother or relative to ask how their child's communication is at home
- Try to teach him to express a yes and a no using spontaneous gestures or vocalizations, and leave the figures for other types of concepts.
- Start with just a pictograph figure to help the child's learning process when using alternative communication
- First make a relation between a concrete object and photo, and then introduce more abstract figures or pictograms
- Help the child express his opinion, selecting the figure, through: physical assistance, modeling or verbal assistance.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

- Use an inclined plane or movable board with a Velcro sticker to hold the figures and help the visualization.
- Use a table with semicircle (crescent shaped) cutout to ensure better positioning.
- Emphasize the same activity, several times, to exercise and encourage learning to be effective.
- Carry out activities with the computer, using a roller mouse, instead of the conventional mouse, as it is a resource that allows easier handling for those who have physical impediments.
- Carry out activities using Power Point *software* to maintain student interest in the computer.

These suggestions were taken from literature on AT resource implementation process (Cook & Polgar, 2014) and from the consultants' experiences working with children suffering from cerebral palsy. Later, the suggestions for interventions were sent to the teacher pair for evaluation, who considered them viable to be implemented in the student's (Flávio's) schooling process:

> We received the guidelines and we think they were great, and we'll apply them in the coming days. Presentations made in [*software*] is a practice that is already being done with the student, for example: the image of the animals appears and after another click the sound of the animal. Regarding the [adapted *mouse*], my school as yet does not have one, I have already requested the purchase for the management team, but as a new committee in charge is being set up, I have to wait for the bureaucratic part (notary office, change of names in the bank etc.). I think it's going to take a while. (Teacher pair - Source: ATC Environment)

In a way, this report allows us to point out that a part of the strategies/activities recommended by the consultants corresponded to the activities that were already being carried out in practice by these teachers. This process of proposing strategies and validation by the participating teachers in a collaborative way coincides with the way literature indicates as being ideal for the consulting process (Idol, Newin, & Paolucci-Whitcomb, 2000). The consultants offer suggestions, and teachers select, test, and implement those they deem feasible and useful.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

3.3 - Consulting procedure implementation

Each one of the recommendations suggested by the consultants, for this case, was systematically applied by the pair in the sessions of specialized educational assistance (SEA) with the student (Flávio). This entire implementation process was registered in the ATC Environment by means of written reports, photos and videos, as summarized below:

Understanding student communication

The consultants' first suggestion for the teacher pair was that they should understand the forms of communication that the student (Flávio) used in his family routine to express his wishes, wants and needs. To do so, they should contact the student's family (the responsible party) to collect such information. This suggestion was followed up by the teacher pair:

> We talked to the father so that he could tell us the form he uses with his son at home to know about his wishes; when he wants to show something; when he is in pain; among others. The father said there is no established way. As he already knows the child needs, he always tries to fulfill them immediately. We asked how he knows that the child wants a particular toy, for example; Father's speech: I already know the toys he likes best, so I always put them at his side. Again we ask: and when Flávio is in pain, how do you know? Does he cry? Does he express any reaction/expression? Father's speech: I realize that he eats very little, and he stays still. (teacher pair - Source: ATC Environment)

The communicative interaction between the educational professional and the children´s family with severe disorders in oral and/or written communication is essential in the area of supplementary and/or alternative communication. Family members can contribute to the teaching and learning process, as they know the children's vocabulary, communicative skills, desires, wishes and interest center (Araujo, 2004; Omote, 2003). As can be seen, the student´s (Flávio's) communication was a very precarious skill that was aggravated by the fact that a basic form of communication to express his wishes, his desires, his feelings and his needs had not been established with him. On the other hand, if the environment leaves toys, food, stimuli available, and the student does not have to demand them in any way, this may limit the development of important communicative skills for later language development.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

Finally, impairments in oral and/or written communication can make it difficult for the child to be involved in the school environment, play and leisure, which may impair child development, since the child may be unable to experience new sensations, interact with other children, to explore and discover toys, games and the social environment around them (Sameshima & Deliberato, 2007; Peres, 2009).

Therefore, because of the consultants' suggestion, the teacher pair carried out certain activities, with attempts to communicate with the student, which were duly filmed and sent to the consultants. The consultants, after having visualized the videos and made their analyses, indicated in note form that a smile could be an interesting element to be worked on in the daily life of the student, being set up as a means of communication, to express consent and satisfaction .

Gesture search: for affirmative and negative responses

Another suggestion indicated by the consultants was to seek/determine, along with the student (Flávio), gestures that represented affirmative and negative answers. Such a procedure was put into practice and a brief description of this action was explained in the account: "So far, we have not been able to find a gesture for his answers, we are trying to get him to reach the object he wants with his arm" (Source: ATC Environment).

As can be seen, an activity search/a gesture determination is not as simple as it seems, and few results were achieved in this regard - during the consulting process. However, the consultants systematically monitored this process and reported that the teachers, who were part of the teacher pair, seemed to be on the right track, since obtaining those answers may involve more prolonged schooling.

Relation between a concrete and abstract object

According to Biaggio (1998) and Piaget (1990), for effective student learning it is important that they succeed in abstracting meaning; therefore, there is a need for experimentation and experience from the empirical object. The pair, following the advice of the consultants in detail, selected an object of interest for the student, a banana, and showed

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

him its purpose and the stimuli provided by this object. They then photographed the banana and made the relation between the concrete object and photo. From there on, the teachers began to use the banana with the student (Flávio) in the SEA appointments so as to establish forms of communication. The results that were reached showed that he could understand the task and the movement to get the object (banana), However, when they added another object, for example, an apple, and asked him to make a choice between one or the other, the student did not discriminate and would get the object that was always on his right.

The consultants informed the teachers that this entire implementation process was time-consuming, even though the expectation was that the child would promptly answer the question and support his response. In addition, they said that it is a complex action for the student, since he should: understand the question that was being asked; think about his answer; visualize what he wanted; and be able to direct his hand.

In order to maximize this task, the consultants gave the following recommendations: (a) the instructions must always be constant: present the object, tell him what it is called, verify that the student recognizes it, and then request the response; (b) objects should be placed further away from the child's midline - thus, the student would have an increase in his visual field and perhaps this would allow the extension movement of the upper limbs in more directions and not only on his right side; (c) the objects must be worked separately, that is, before the student has to choose between two objects, it would be important to work with only one and only then add the other. As soon as the other object is added, the teacher pair should also offer modeling and physical assistance to the student, in the following way: hold on to the student's arm and help him to get or point to the object.

In the study by Manzini, Martinez, Lourenço, & Brito (2017), the authors aimed at describing the educational training process of interlocutors for a child presenting cerebral palsy, using alternative communication. Guidance was provided to the interlocutors about the activity, the alternative communication figure and/or the object to be offered, what stimulus should be used (concrete object or communication figure), what would the best strategy for presenting the activity and "tips" about how the interlocutor's performance should be during the activity.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

Activities using "*Patati* and *Patatá*"

The teacher pair decided to change the concrete object (banana) and look for another one that would arouse greater interest in the boy and help him establish communication. The choice was a towel of the "*Patati* and *Patatá*"[4] clowns, used to catch his saliva. Thus, the teacher pair decided to use these characters in the SEA appointments - using puppets of the clowns, as can be seen below:

> I provided two puppets, one of *Patati* and one of *Patatá*, to know what the student's preference would be. He immediately directed his gaze, bringing both hands to *Patatá*. I introduced the work with the student, took the DVD to interact with the child and afterwards I carried out some interventions as can be seen in the 3 videos [these videos were posted in the ATC Environment]. As I see it, I think I'm starting to reach the goals! (Teacher pair - Source: ATC Environment).

When checking the reports and videos sent by the teacher pair, the consultants praised them for having been able to find an activity based on the student's interest. In general, through the filming, it was possible to perceive the student's involvement and intention in moving the puppet, his attention in the proposed activity and the initiative of communication during the conversation with the teacher.

In this way, the consultants emphasized the importance of the teachers continuing to invest in other activities that involve *Patati* and *Patatá* themes. To do so, they offered some suggestions: (a) to exploit the colors of the clowns; (b) to exploit the body parts (big nose and red, colored hair); (c) to set up simple, clear and objective sentences and stories using concrete objects and software figures; (d) to work with the puppet in the child's hand for him to handle the toy - it could be the hand with the lesser ability so that the child could hold the puppet with the most skilled hand; (e) to use the computer, developing activities initially in the presentation construction software with photos of *Patati* and *Patata* - one on each slide, using the trigger so that the figure could be highlighted or present an effect (the teacher should also indicate the name of each of the puppets).

[4] Patati and Patatá are two Brazilian clowns. T/N

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

Use of the inclined plane board with self-adhesive Velcro and the table with a semicircle cutout (crescent shaped)

As recommended, the teacher pair started to use, in the SEA appointments with the student (Flávio), an inclined plane board with a Velcro sticker and table with a semicircle (crescent shaped) cutout, which were resources used to help the stability of the trunk and to help the student manually reach the presented figures of choice (Sankako, 2013). Despite these resources having been available in the multifunction feature room, and perhaps due to lack of knowledge, they were not used frequently. However, during their use, questions emerged (which were taken up with the consultants) on how best to position them so that they could provide better results for the student. In addition, the teacher pair questioned their positioning with these resources:

Questions from the teacher pair	Consultants' answers
What is the best position to carry out the activity with the student? Standing, sitting in front of him or at his side? The three forms were used in the videos. The inclined plane was leaning against the protection of the cutout table, because that way it would move out of place. What would be ideal: closer to the student or at the height we left it? Is the height of Velcro placed correctly on the inclined plane? We await your feedback and would to thank you for your guidance and suggestions.	We believe that if you position yourself a little more in front of the child, he will be able to perform the visual-motor coordination, paying more attention. In our opinion, the adapted table should be lower to help the child's arm flexion and extension movement. Thus, the inclined plane would not be so high. The Velcro could be in the middle of the inclined plane to help the child to see. Regards!

Figure 2 - Conversation between the teacher pair and the research consultants

Source: ATC Environment (2015)

As can be seen, the doubts that emerged during the consulting process were potentially solved, so that the collaboration between the teacher pair and consultants proved to be an important element for the operation of the AT distance collaborative consultation service.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

3.4 - Evaluation of the proposed servisse

According to the teacher pair, the benefits achieved through the procedures of distance collaborative consulting service in AT, for the student's (Flávio) case, were beyond their expectations. Check out an illustration of this event: "Starting with objects from his reality, from his context and interest, I was able to get answers that I previously believed did not exist" (Teacher pair – Source: FECC Questionnaire).

The benefit reported by the teacher pair, in the excerpt above, refers to the success factors obtained in the communication of the student (Flávio), who had serious difficulties in this area. The communication skill improvement allowed the teachers to enhance the student's schooling process.

Based on the reports of the teacher pair, it was also possible to verify that the benefits from the collaborative consultation service contributed to the academic development of other students that were not participating in the study. "The consultation even helped to solve problems with other students" (Teacher pair – Source: FECC Questionnaire).

This result shows that the collaborative consultation activity allowed the teacher to learn, a fact which can be applied in the resolution of situations with other students besides Flávio - the focus of the consultation. Kampwirth (2003) indicates that, among the main characteristics of collaborative consultation process, there is the potential to allow a more effective educational action with the target student within the model, while at the same time making it possible to improve everyone's performance, mainly by encouraging teachers involved, to develop plans for solving everyday practice problems.

The teacher pair also reported that the Distance Collaborative Consulting service in AT contributed to their professional performance improvement. Among the benefits indicated, it was possible to verify that the service provided moments of professional reflection and the possibility to solve doubts about the schooling process of students with cerebral palsy. "I was able to ask questions about the doubts that I had at work with my students and improve my professional performance. ... The past directions made me reflect on what activities I would propose to my student "(Teacher pair – Source: FECC Questionnaire).

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

For Araújo and Almeida (2014) and Mendes et al. (2011), the empowerment resulting from the educational training process experienced by the collaborative process, helps the teacher to solve, with more sensitivity and ability, the academic obstacles related to their professional practice, based on the knowledge acquired and produced in previous experiences with the collaborative consultation service rendering model.

According to the pair, the positive points of the Distance Collaborative Consultation in AT were: "attention and availability of the researcher; an easy to understand environment; consultants' advice; directions at a distance" (Teacher pair – Source: FECC Questionnaire).

In relation to the researcher`s attention and availability, it is worth mentioning that there was constant communication, through the VLE, between the researcher and the teacher pair, as well as with the consultants. The importance of the researcher, as a mediator and organizer of information exchange, was paramount for there to be full support throughout the consultation. Another positive point reported was that VLE was easy to understand, self-instructive, with no need for training to be used. All the information was very clear and intuitive, and the design of the ATC environment was specific for the research, which ensured better organization of the available tools.

The consultants' suggestions were scored by the teacher pair as positive, and because they were three consultants with educational training in the area and due to having focused their studies on aspects such as alternative communication; computer access; and pedagogical resource adaptation; diversity in the AT areas was paramount so that the consultation could be very productive. Distance interactions were the last positive point highlighted. Teachers normally have an extensive workload, and in-service training is an important way for them to continue their academic education.

Among the negative aspects, the teacher pair emphasized: "The consultants delay in feedback; the researcher or consultant not knowing the student" (Teacher pair – Source: FECC Questionnaire).

The teacher pair indicated that the delay by the consultants in giving feedback to the case was a negative point. Although the guidelines were positive, the delay in response was a complication and could have discouraged participants from the consulting process, since communication is one of the most important factors in establishing the partnership (Idol et

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

al., 2000). This fact is justified by there being three consultants: two of them effective teachers and one a substitute teacher of undergraduate courses from a public university. The expectation was created and all the demands answered, but not in due time, because the consultants acted voluntarily in the project, despite having their own daily professional assignments to fulfill.

And the other negative point is that the consultants and the researcher did not know the student in person. The teachers considered that it took more time to establish the proposals presented to the teachers. Actually, although the VLE favored video recording, which was a strategy carried out for the better understanding of the case in question by the consultants, some details would only be possible if they were in a natural and real-time environment.

Finally, the teacher pair recommended the AT Collaborative Consultation service to other teachers, with the justification that "so that we are able to ask questions and improve the practices with the students" (Teacher pair – Source: FECC Questionnaire).

This indication reinforces the need that for the real implementation of the AT resource in the SEA spaces, it is necessary for the teacher support strategies to be permanent. The use of materials and equipment should be encouraged, and teachers need to count on educational training and support for this process.

.

4 - Final Considerations

The increase of enrollments of the Special Education target group students in Brazilian schools has contributed to broaden the demands in the field of teacher education, partly because ensuring the participation and learning in schools requires knowledge and skills in the use of technical resources that not even the supposedly specialized teachers are able to command.

Thus, considering the importance of AT resources for the schooling of students with cerebral palsy and the context of scarce teacher training in this area, the problem that started the present study was how to provide, at the same time, support for students with severe

http://dx.doi.org/10.1590/1980-6248-2016-0085

motor impairments and teacher training in the AT area for their specialized teachers. The solution investigated here was an attempt to innovate, proposing an alternative of distance collaborative consultation.

In general, it can be said that the study produced positive results on the procedures used, demonstrating: 1) the importance of the teacher support offered through the school collaborative consultation in AT with the participation of trained professionals conducting virtual guidelines; and 2) academic performance improvements of the target student in the research, based on the recommendations provided by professionals specialized in the area of AT.

Some aspects deserve to be highlighted, as they are related to the results achieved: the highly qualified expertise of three consultants in the AT area, for the collaborative school consulting in the cerebral palsy area and AT; and the adopted strategy of problem solving, based on a concrete case study, and not from classes, merely theoretical content, without a bases in real problems experienced by the teachers.

It should also be noted that the chosen student is part of a relatively small subgroup of students from the Special Education target group, which is made up of students with severe motor impairments and complex communication needs. The present study shows that access to a common class, with exposure to a common curriculum, associated with specialized educational services, may not respond to the differentiated needs of these students, and therefore, the right to education is not guaranteed to this portion of the population. The presence of these students in schools has shown us how much we still need to increase the number of services to guarantee an effective policy of school inclusion.

The results show that the partnership between educational professionals and the multidisciplinary team, in the schooling of children and young people with cerebral palsy who require the use of AT resources, is possible and desirable (Calheiros & Mendes, 2016), since they enhance students' performance and abilities and favor the acquisition of new skills to perform school tasks (Baleotti & Zafani, 2017; Pelosi & Nunes, 2011; Rocha, 2013). In this sense, these professionals, in order to contribute to the policy of school inclusion, need to be trained for the socio-educational model, more directed to work in collaboration with educators and parents, rather than focusing on individuals with disabilities and their deficits.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

And so, the service rendering model based on collaborative consultation has shown itself to be promising for the training of professionals who can give support to schools.

Regarding the limits pointed out by the study, it is worth noting that despite the positive evaluation of distance consulting, the specialized teachers require a face-to-face contact between the consultants and the AT user. However, it should be pointed out that the purpose of the study was precisely to evaluate the possibilities of the service rendering model and distance consulting training, since literature has already shown the benefits of the face-to-face model. What the data suggest, therefore, is that these models should be used as complements, that is, that the distance consulting be combined with the face-to-face school collaborative consultation in order to guarantee the continued use of the resource and maintain the achieved benefits.

Future studies are indicated, both longitudinal (to follow the child's path and performance in academic activities with the use of AT resources), and together with the contexts in which the child is inserted (clinical, family and school environment), in order to disseminate the consultations with therapists, family members and teachers.

Finally, the importance of investing in policies for the continuous training of teachers to generate new knowledge directed towards the guidance and the capacitation of these professionals in the area of the AT, is verified, so that support is continuous, and the teacher is encouraged to use AT resources in their daily practice.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

References

André, M. E. D. A. (1984). Estudo de caso: seu potencial na educação. *Cadernos de Pesquisa,* 49, 51-54.

Araújo, E. A. C. (2004). Parceria família-profissional em educação especial: promovendo habilidades de comunicação efetiva. In E. G. Mendes, M. A. Almeida, & L. C. A. Williams (Orgs.), *Avanços recentes em Educação Especial* (pp. 175-178). São Carlos: EDUFSCar.

Araújo, S. L. S., & Almeida, M. A. (2014). Contribuições da consultoria colaborativa para a inclusão de pessoas com deficiência intelectual. *Revista Educação Especial*, 27(49), 341-352.

Assis, C.P. (2103). *Avaliação de um Programa em Consultoria Colaborativa na escola para graduandos em Terapia Ocupacional.* Tese de Doutorado, Universidade Federal de São Carlos, UFSCar, São Carlos.

Baleotti, L. R., & Zafani, M. D. (2017). Terapia ocupacional e tecnologia assistiva: reflexões sobre a experiência em consultoria colaborativa escolar. *Cadernos Brasileiros de Terapia Ocupacional*, *25*(2), 409-416.

Bardin, L. (2011). *Análise de conteúdo*. São Paulo: Edições 70.

Biaggio, A. M. B. (1998). *Psicologia do desenvolvimento*. Petrópolis: Vozes.

Brasil (2013). *Viver sem Limites:* Plano Nacional dos Direitos da Pessoa com Deficiência. Recuperado em 23 junho de 2014, de http://www.pessoacomdeficiencia.gov.br/app/sites/default/files/arquivos/%5Bfield_generico_imagens-filefield-description%5D_0.pdf

Calheiros, D. S., & Mendes, E. G. (2016). Consultoria colaborativa a distância em tecnologia assistiva para professores. *Cadernos de Pesquisa, 46*(162), 1100-1123.

Calheiros, D. S., Mendes, E. G., & Mendonza, B. A. P. (2016). Desenvolvimento de um ambiente virtual de aprendizagem para apoiar o uso da tecnologia assistiva por professores. *Revista Teias,* 17 (edição especial), 225-239.

Cook, A. M., & Polgar, J. M. (2014). *Assistivies technologies: principles and practice*. St Louis: Mosby.

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

Correia, D. S. M. L. (2013). *A percepção dos docentes da educação regular e da educação especial sobre a sua prática colaborativa inclusiva, na educação pré-escolar e no ensino básico*. Dissertação de Mestrado, Escola Superior de Educação João de Deus, Lisboa, Portugal.

Deliberato, D. (2011). Sistemas suplementares e alternativos de comunicação nas habilidades expressivas de um aluno com paralisia cerebral. *Revista Brasileira de Educação Especial*, *17*(2), 225-244.

Dounis, A. (2013). *Atividade docente e inclusão: as medi produzidas pela Consultoria Colaborativa*. Dissertação de Mestrado, Universidade Federal de Alagoas, Maceió, Brasil.

Galvão Filho, T. (2011). Favorecendo práticas pedagógicas inclusivas por meio da Tecnologia Assistiva. In L. R. O. P. Nunes, M. B. Pelosi, & C. C. F. Walter (Orgs.), *Compartilhando experiências: ampliando a comunicação alternativa* (pp. 71-82). Marília: ABPEE.

Hummel, E. I. (2012). *Formação de professores das salas de recursos multifuncionais para o uso da tecnologia assistiva*. Tese de Doutorado, Universidade Estadual Paulista, Marília, Brasil.

Idol, L., Newin, A., & Paolucci-Whitcomb, P. (2000). *Collaborative consultation*. Texas: Pro-Ed.

Kampwirth, T. J. (2003). *Collaborative consultation in the schools: effective practices for students with learning and behavior problems*. New Jersey: Pearson Education.

Lourenço, G. F. (2012). *Avaliação de um programa de formação sobre recursos de alta- tecnologia assistiva e escolarização*. Tese de Doutorado, Universidade Federal de São Carlos, São Carlos, Brasil.

Lüdke, M., & André, M. E. D. A. (1986). Abordagens qualitativas de pesquisa: a pesquisa etnográfica e o estudo de caso. In M. Lüdke, & M. E. D. A André*, Pesquisa em educação: abordagens qualitativas* (Cap. 2, pp. 11-24). São Paulo: EPU.

Manzini, E. J. (2011). Formação de professores e tecnologia assistiva. In K. R. M. Caiado, D. M. Jesus, & C. R. Baptista (Orgs.), *Professores e educação especial: formação em foco* (p.45-63). Porto Alegre: Mediação.

Manzini, E. J., & Deliberato, D. (2007). *Equipamento e material pedagógico especial para educação, capacitação e recreação da pessoa com deficiência física: recursos pedagógicos II*. Brasília: Brasília: MEC/Secretaria de Educação Especial.

http://dx.doi.org/10.1590/1980-6248-2016-0085

Manzini, M. G., Martinez, C. M. S., Lourenço, G. F., & Brito, B. (2017). Formação de interlocutores de uma criança com paralisia cerebral para o uso da comunicação alternativa. *Cadernos Brasileiros de Terapia Ocupacional, 25*(3), 553-564.

Mendes, E. G., Almeida, M. A., & Toyoda, C. Y. (2011). Inclusão escolar pela via da colaboração entre educação especial e educação regular. *Educar em Revista*, *41*(2), 80-93.

Mendes, E. G., & Lourenço G. F. (2012). Recursos computadorizados de tecnologia assistiva para estudantes com paralisia cerebral em múltiplos contextos. In E. G. Mendes, & M. A. Almeida, *Dimensões pedagógicas nas práticas de inclusão escolar* (pp. 421-444). Marília: ABPEE.

Omote, S. (2003). A deficiência e a família. In M. C Marquezine, & M. A. Almeida (Org.), *O papel da família junto ao portador de necessidades especiais* (pp. 15-18). Londrina: Eduel.

Pelosi, M. B. (2008). *Inclusão e Tecnologia Assistiva*. Tese de Doutorado, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brasil.

Pelosi, M. B., & Nunes, L. R. D. P. (2011). A ação conjunta dos profissionais da saúde e da educação na escola inclusiva. *Revista de Terapia Ocupacional da Universidade de São Paulo*, *22*(1), 52-59.

Pena, F. F., Rosolém, F. C., & Alpino, A. M. S. (2008). Contribuição da Fisioterapia para o bem-estar e a participação de dois alunos com Distrofia Muscular de Duchenne no ensino regular. *Revista Brasileira de Educação Especial*, *14*(3), 447-462.

Pereira, V. A. (2009). *Consultoria colaborativa na escola: contribuições da psicologia para inclusão escolar do aluno surdo.* Tese de Doutorado, Universidade Federal de São Carlos, São Carlos, Brasil.

Peres, A. (2009). A importância da comunicação suplementar e alternativa no processo de reabilitação de crianças e adultos. In *III Congresso Brasileiro de Comunicação Alternativa*. São Paulo, Brasil.

Piaget, J. (1990). *Epistemologia genética*. São Paulo: Martins Fontes.

Rocha, A. N. D. C. (2013). *Recursos e estratégias da tecnologia assistiva a partir do ensino colaborativo entre os profissionais da saúde e da educação*. Tese de Doutorado, Universidade Estadual Paulista, Marília, Brasil.

http://dx.doi.org/10.1590/1980-6248-2016-0085

Rocha, A. N. D. C., Deliberato, D., & Araújo, R. C. T. (2015). Procedimentos para a prescrição dos recursos de tecnologia assistiva para alunos da educação infantil com paralisia cerebral. *Revista de Educação Especial*, *28*(53), 691-707.

Sameshima, F. S., & Deliberato, D., (2007). Habilidades comunicativas utilizadas por um grupo de alunos não falantes durante atividade de jogo. In L. R. O. P. Nunes, M. B. Pelosi, & M. R. Gomes (Orgs.), *Um retrato da comunicação alternativa no Brasil*: *Relatos de pesquisas e experiências* (pp. p.118-122). Rio de Janeiro: 4 Pontos estúdio gráfico e papéis.

Sampieri, R. H., Collado, C. F., & Lucio, M. P. B. (2006). *Metodologia de pesquisa*. São Paulo: McGraw-Hill.

Sankako, A. N. (2013). *Tecnologia assistiva das salas de recursos multifuncionais: avaliação de dispositivos para adequação postural.* Tese de Doutorado, Universidade Estadual Paulista, Marília, Brasil.

Silva, A. M. (2010). *Psicologia e inclusão escolar: novas possibilidades de intervir preventivamente sobre problemas comportamentais*. Tese de Doutorado, Universidade Federal de São Carlos, São Carlos, Brasil.

Silva, C. R. B. (2007). *A formação do fonoaudiólogo: desafios e perspectivas para a educação inclusiva.* Dissertação de Mestrado, Pontifícia Universidade Católica de Campinas, Campinas, Brasil.

U.S. Government. *Public Law 108-364, 25 Oct. 2004.* Assistive Technology Act of 2004.108th Congress.U.S. Government Publishing Office, Washington, DC, 25 Oct. 2004. Recuperado em 23 de junho de 2014, de https://www.gpo.gov/fdsys/pkg/STATUTE-118/pdf/STATUTE-118-Pg1707.pdf

Vilaronga, C. A. R., Mendes, E. G., & Zerbato, A. P. (2016). O trabalho em colaboração para o apoio à inclusão escolar: da teoria à prática docente. *Interfaces da Educação*, *7*(19), 66-87.

Legislação

Decreto BR n.º 7.611, de 17 de novembro de 2011. (2011). Dispõe sobre a educação especial, o atendimento educacional especializado e dá outras providências. Recuperado em 22 de

pro-posições
e-ISSN 1980-6248
http://dx.doi.org/10.1590/1980-6248-2016-0085

junho de 2014, de http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2011/Decreto/D7611.htm.

Resolução BR n.º 466, de 12 de dezembro de 2012. (2012). Trata de pesquisas em seres humanos e atualiza a resolução 196. Recuperado em 23 de junho de 2014, de http://conselho.saude.gov.br/resolucoes/2012/Reso466.pdf

Submitted in June 24, 2016; revised in September 28, 2017, accepted for publication in December 20, 2017.