

The use of assistive technology for occupational therapists in the Brazilian educational context: a literature review¹

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Abstract: This article aims to present, through a bibliographic review, how occupational therapists have organized their discussions on the use of assistive technology resources at the school environment. An active search around this theme was performed in different databases, Scientific Electronic Library Online (Scielo); Virtual Health Library (Bireme); Revista de Terapia Ocupacional da Universidade de São Paulo; Cadernos de Terapia Ocupacional da Universidade Federal de São Carlos, for the period between 2005, to the first trimester of 2013. The result showed the systematization of eleven studies related to assistive technology, occupational therapy, the educational context, and educational inclusion. The analysis revealed that occupational therapists worry about the need to educate teachers to use the assistive technology resources in the process of educating disabled students. The number of works found is still small considering the demand of the assistive technology and education area. There is a greater number of works about research reports, and fewer works about the theoretical foundation of assistive technology and its relation with Occupational Therapy in the school environment.

Keywords: *Mainstreaming, Self-help Equipment, Occupational Therapy.*

O uso da tecnologia assistiva por terapeutas ocupacionais no contexto educacional brasileiro: uma revisão da literatura

Resumo: Este artigo tem por objetivo apresentar, por meio de uma revisão bibliográfica, como os Terapeutas Ocupacionais têm se organizado para promover discussões sobre o uso dos recursos de tecnologia assistiva no ambiente escolar. Desse modo, foi realizada busca ativa acerca deste tema em diferentes bases de dados: *Scientific Electronic Library Online* (Scielo); Biblioteca Virtual em Saúde (Bireme); Revista de Terapia Ocupacional da Universidade de São Paulo, e Cadernos de Terapia Ocupacional da Universidade Federal de São Carlos, no período de 2005 ao primeiro trimestre de 2013. Como resultado da busca, apresentou-se a sistematização de 11 estudos relacionados à tecnologia assistiva, à Terapia Ocupacional, ao contexto educacional e à inclusão escolar. A análise dos artigos mostrou que Terapeutas Ocupacionais se preocupam com a necessidade de formação de professores para o uso dos recursos de tecnologia assistiva no processo de escolarização de alunos com deficiência. O número de trabalhos encontrados ainda é incipiente frente à demanda que se apresenta na área de tecnologia assistiva e educação. Há um número maior de trabalhos referentes a relatos de pesquisa, poucos trabalhos sobre a fundamentação teórica da tecnologia assistiva e a sua relação com a Terapia Ocupacional no ambiente escolar.

Palavras-chave: *Inclusão Educacional, Equipamentos de Autoajuda, Terapia Ocupacional.*

1 Introduction

According to Rocha (2007), Occupational Therapist insertion in education area happened through the Special Education, in which the professional's work was directed to population with disabilities or developmental disorder studied in special education schools, segregated from regular school system.

Occupational Therapist actions in these institutions were teacher's support through the difficulties presented by the students, such as those related to possible adjustments in the classroom, in the physical structure, in carrying out activities and guidance about the use of assistive resources (ROCHA, 2007).

With the expansion of public policies for this population and proposals for inclusion of students with special educational needs in the regular school system, the Occupational Therapists redirected their context and the way of working beyond a merely rehabilitation view (LOURENÇO; CID, 2010).

The paradigm of inclusion is based on the belief of a society for all its citizens – a proposal to citizenship construction. In this sense, inclusion is understood as a set of actions to be built daily, aiming to raise awareness of people with special needs and their families about their rights, duties and opportunities as citizens and to society, being responsible for all its members, welcoming them indiscriminately and offering them effective possibilities for real participation and acting in society (SASSAKI, 1997; MARINS; PALHARES, 2007; ROCHA, 2007; ROCHA; LUIZ; ZULIAN, 2003).

Thus, Occupational Therapist interventions are not restricted to children and their rehabilitation process, since their performances also take place together with the school community and the family, aiming to promote and improve children's participation in this context and in all their activities. Interventions may also occur using assistive technology, with adjustments and reorganizations on the environments, furniture, and materials used by the children (IDE; YAMAMOTO; SILVA, 2011; DE CARLO; BARTALOTTI, 2001).

According to Sartoretto and Bersch (2013), the term Assistive Technology (AT), translated in Brazil as Tecnologia Assistiva (TA), was established in 1988 as an important legal element within the USA legislation, known as Public Law 100-407, and renovated in 1998 as Assistive Technology Act of 1998 (PL 105-394, S.2432).

The word "Assistive" comes from assist (which assists and help) and it is not yet included in

the Portuguese vocabulary, but it has been used commonly associated with the word technology. It is a recent term used to identify the full range of resources and services that contribute to promote and expand skills of people with functional, motor, sensory or mental limitations and therefore promote independence and inclusion.

Technology throughout the history has been used to facilitate human life and is now considered assistive when it is used to help in functional performance of activities, reducing disabilities to perform activities. Thus, it is common to observe statements that for people with disabilities, technology goes further: it is the difference between "can" and "cannot" performing actions, since they can promote independence, autonomy and access. For this reason, specialized technological resources or support equipment are being used and produced more frequently in recent years (ROCHA; CASTIGLIONI, 2005).

Assistive technologies involve mechanical, biomechanical, ergonomic, functional, kinesiology, ethical, aesthetic, political, emotional, and subjective aspects and as such, they should be understood.

According to Rodrigues and Alves (2013), assistive technology currently represents an increasing area, empowered by the paradigm of social inclusion, advocating the participation of people with disabilities in the different environments of society. However, the authors point out that despite the great demand of this area in Brazil, the research and AT projects are still incipient and restricted to specialists involved with people with disabilities.

Some Brazilian public policies have contributed to generate AT demands in large scale. One of them is the National Policy for Special Education in the Perspective of Inclusive Education (BRASIL, 2008). The guidelines of this policy, with its rules and guidelines for school inclusion of people with disabilities, point out that the full participation of these students can be guaranteed with the presence of AT resources, not only at school but also in all learning processes of these subjects (RODRIGUES; ALVES, 2013).

In this sense, AT in the school routine is associated with the need to adapt the school environment to welcome children with special educational needs, since inclusive education advocates changes throughout the educational structure, in which the school is fitted to receive this students, confirming the idea that the environment must adapt to the student and not vice versa (OLIVEIRA, 2008).

2 Methodology

This is a literature review held in different databases of Scientific Electronic Library Online (SciELO); Virtual Health Library (Bireme); Revista de Terapia Ocupacional da Universidade de São Paulo; Cadernos de Terapia Ocupacional da Universidade Federal de São Carlos, in the period from 2005 to the first trimester of 2013. It proposed to understand the ways taken by Occupational Therapists about the use of Assistive Technology associated with the Brazilian educational context.

There were 11 studies found in the process of systematization of bibliographic materials, and the search was performed using the following keywords: Assistive Technology, Inclusive Education and Occupational Therapy.

The results were tabulated, organized by year of publication, description of authors, type of study, title and publication journal.

3 Results

The publication of the 11 studies were from eight different journals, and only the Revista Brasileira de Educação Especial had more than one publication on the subject of this review (Table 1), corresponding to 36.3% of the sample. The highest incidence of publications occurred in 2012, with five studies, followed by 2009, with three studies. The other years had only one publication each.

From the studies found, only one addressed theoretical and epistemological content on assistive technology. The rest were experiments and research reports. These articles have several methodological approaches, such as studies cases, quantitative

research and training groups and professional updates (Table 2).

4 Discussion

The most recent article was from Plotegher, Emmel and Cruz (2013), which aimed to report the use of assistive products to help in the academic performance of students with disabilities enrolled in regular network education of São Carlos-SP. It consists of an extension project report, in which undergraduate students in Occupational Therapy performed several actions with students with different disabilities. As result, it is emphasized that the difficulties pointed out by the students were demonstrably mitigated or neutralized using assistive technology, and they have affected the teachers' perception of the importance of the use of AT resources in their classrooms.

The study by Varela and Oliver (2012) aimed to understand the use of assistive technology for children with disabilities in everyday life, with the school community as one of the performance areas. The object of study were five children assisted in primary health care service in the city of São Paulo, presenting resources used by these people in the school environment, such as adapted chair in the classroom, walker, wheelchair, tricycle, adapted school transportation and handrail on the stairs.

Ferroni and Gasparetto (2012) conducted a study seeking to understand the relationship with the community and the use of AT resources in daily activities, and aimed to know the perception of students with low sight in relation to their eyesight impairments.

Also in 2012, Gasparetto et al. conducted a quantitative and qualitative research with 46 students

Table 1. Distribution of the studies according to the journals and year of publication.

Name of journal	Year					Total
	2005	2009	2011	2012	2013*	
Cadernos de Terapia Ocupacional da UFSCar					1	1
Revista Brasileira de Crescimento e Desenvolvimento Humano		1				1
Revista Brasileira de Educação Especial		1	1	2		4
Revista Ciência & Saúde Coletiva				1		1
Revista Científica do Unisaesiano Lins				1		1
Revista Informática na Educação: Teoria e Prática				1		1
Revista de Terapia Ocupacional da USP	1					1
Tecnologia Assistiva (CAT)		1				1
	1	3	1	5	1	11

*First trimester of 2013.

Table 2. Actions of Occupational Therapeutic and the use of assistive technology.

Year	Author (s)	Journal publication	Title	Type of study
2013	PLOTEGHER, C. B.; EMMEL, M. L. G.; CRUZ, D. M. C.	Cadernos de Terapia Ocupacional da UFSCar	Use of assistive devices for students with disabilities in public schools.	Experience report
2012	FERRONI, M. C. C.; GASPARETTO, M. E. R. F.	Revista Brasileira de Educação Especial	Students with low sight: perception of the eyesight impaired, review of relationships with the school community and the use of assistive technology resources in everyday activities.	Research
2012	GASPARETTO, M. E. R. F. et al.	Revista de Informática na Educação: teoria e prática	Use of assistive technology resources for students with sight impairment.	Research
2012	ROCHA, A. N. D. C.; DELIBERATO, D.	Revista Brasileira de Educação Especial	Assistive Technology for children with cerebral palsy in school: identification of needs.	Research
2012	SAMESHINA, F. S.; SILVA, F. R. P.	Revista Científica do Unisaesiano	Implementation of Resources and Procedures of assistive technology in the specialized educational services.	Research
2012	VARELA, R. C. B.; OLIVER, F. C.	Revista Ciência & Saúde Coletiva	The use of Assistive Technology in everyday life of children with disabilities.	Research
2011	ALVES, A. C. J.; MATSUKURA, T. S.	Revista Brasileira de Educação Especial	Perception of students with cerebral palsy on the use of assistive technology resources in regular schools.	Research
2009	GASPARETTO, M. E. R. F. et al.	Tecnologia Assistiva (CAT)	Use of resources and assistive technology equipment in the municipal, state and federal technological education.	Research
2009a	PELOSI, M. B.; NUNES, L. R. O. P.	Revista Brasileira de Crescimento e Desenvolvimento Humano	Training of health professionals in the service area of assistive technology: the role of the Occupational Therapist.	Research
2009b	PELOSI, M. B.; NUNES, L. R. O. P.	Revista Brasileira de Educação Especial	Characterization of itinerant teachers, their actions in the area of assistive technology and their role as school inclusion agent.	Research
2005	ROCHA, E. F.; CASTIGLIONI, M. C.	Revista de Terapia Ocupacional da USP	Reflections on technological resources: technical aids, assistive technology, care technology and support technology.	Theoretical study

with eyesight impairment who were enrolled in regular schools. The objective was to investigate the variables of age, gender, eyesight acuity, residual eyesight, assistive technology, accessible informatics and group interaction. The results showed participants' interest in using these resources in school and daily activities, enabling the awareness of the school community on the effectiveness of AT resources to assist learning and students' interest in the activities of regular education (GASPARETTO et al., 2012).

The study of Rocha and Deliberato (2012) aimed to identify the need of services, resources and assistive technology strategies for the student with cerebral palsy at school. As the main result, there is the statement of the authors about "[...] the importance of teacher's training not only for the use of resources, but to establish the strategies to use of materials [...]" (ROCHA; DELIBERATO, 2012, p. 87).

Sameshima and Silva (2012) conducted a study aimed at using a program based on additional and alternative communication systems to train professionals of a school. It was held in the city of Lins and the object of study was two specialized teachers in special education. It is worth noting that "[...] the results identified in this study enable the reflection on essential questions for orientation and training of teachers and other professionals regarding the use of assistive technology in the educational context [...]" (SAMESHIMA; SILVA, 2012, p. 75).

Alves and Matsukura (2011) conducted a study on the perception of students with cerebral palsy in the use of assistive technology in regular schools. It is noted that the study potential were the reports of the students about the use of these resources, providing significant results and also observing as in other studies, that the children who used the resources were able to show their individual needs, as well as assessment and perception of AT.

Gasparetto et al. (2009) had the objective of analyzing the use of resources and assistive technology equipment to help students with disabilities in the performance of educational activities. In the reports, it is noticed that "[...] not all teachers working with students with disabilities know to use the resource [...]" (GASPARETTO et al., 2009, p. 56).

In the same year, Pelosi and Nunes (2009a) developed a project that aimed to implement, plan and evaluate a training course on AT, directed to health professionals. The results highlighted in this study were that few professionals (24%) reported being able to evaluate and determine the students' needs, and that less than 15% of the respondents

considered themselves able to adapt math or reading and writing activities.

The results of all these studies complement each other to promote improvements in all aspects of the use of AT, since there is the need for teachers' training for the use of AT, but also "[...] there is a big discussion regarding the continuing education of teachers and their classroom reality and there is little information about the training of health professionals [...]" (PELOSI; NUNES, 2009a, p. 441).

Another study by Pelosi and Nunes (2009b) was carried out together with the Municipal Department of Education of the City of Rio de Janeiro, in which the action of itinerant teachers with students with special educational needs were compared, pointing solutions to favor the inclusion of students with physical disabilities. This study indicated that, however schools offer high technology resources, the teachers do not use them for lack of education or management domain.

Finally, the study by Rocha and Castiglioni (2005) was the only one to theoretically discuss the use of AT, making an analysis as to the meaning and purpose of AT resources for inclusion of people with disabilities, critically analyzing how these features are arranged, effective and satisfactory for students.

5 Conclusion

From this literature review, it was understood that the use of assistive technology in the school environment is approached by several Occupational Therapists by the significant importance on the topic, for the school community and for children with special educational needs.

Most articles found are results of qualitative research in which the priority target population were children with special educational needs and teachers. Most of the studies are linked to higher education institutions. There were no reports about the practice of therapists who are not linked to these institutions. Only one study is directed to the training of health professionals and only one study discusses critically and conceptually the use of AT resources.

However, these studies show the action of the Occupational Therapist as one of the modifying agents of reality, often excluding the Brazilian educational school in which each professional demonstrates their ways to fight for a school inclusion with fewer barriers and more potentiality.

The school should be understood as a promoter environment of citizenship, in which the collective

construction of an environment suitable to use it by any individual, being part of the daily life of the institution.

As listed by most of the studies, the technology comes together with the possibility of changes and must be understood and used in the best possible way. Therefore, it is necessary to acquire these products, but also the training of professionals for their use, not only by educators but also by health care professionals who need to know how to evaluate, contributing to the effective use of AT.

The Occupational Therapist has been one of the professionals with training and knowledge to use assistive technology as a resource in the process of school inclusion of students with disabilities. The multi-functional resources classrooms and specialized educational assistance in schools give the opportunity to important partnerships in the development and implementation of new practices in everyday school life. However, the Occupational Therapist should be concerned with the idea that the assistive technology resources should be reduced to individual difficulties. It is necessary to go further and AT resources be accessible to students with special needs, their families and the whole school community. We agree with Rocha and Castiglioni (2005), when the authors say that the technological resources are not facilitating or hindering the school inclusion process. However, it is necessary to have these resources together with the satisfaction and personal development of individuals and social groups to which they belong.

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Author's Contributions

All authors contributed to the development of all stages of the research and text editing.

Notes

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