

# The RTI Model as a prevention strategy for learning disorder

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## Abstract

This research aimed to present the RTI model, as well as its suitability and relevance as an effective and alternative proposal to the Brazilian curricular bases. A bibliographic review had performed, which included national and international scientific publications, developed in the last 10 years. The descriptors used: "response to intervention", "education" and "learning disorder". The retrieved texts had read, analyzed and categorized: (A) Historical background; (b) structure; (c) effects observed for model consolidation; (d) possible contributions of RTI to Brazilian education. The Brazilian educational system can cope with its failure and dropout rates by adopting RTI. The model may favor: (1) prevention through periodic monitoring of children's performance; (2) corrective character when offering tutoring. Discussions about the effects of RTI are considered emerging and necessary, as they are relatively recent in Brazil, especially to consolidate the social transformation function of educational agents.

**Keywords:** Response to intervention; learning disabilities; school failure.

## *El Modelo RTI como estrategia de prevención a los trastornos de aprendizaje*

### Resumen

En esta investigación se buscó presentar el modelo RTI y, también, su pertinencia y relevancia como propuesta efectiva y alternativa a las bases curriculares brasileñas. Se realizó una revisión bibliográfica, contemplando publicaciones científicas, nacionales e internacionales, desarrolladas en los últimos 10 años. Se utilizó como descriptores: "respuesta a la intervención", "educación" y "trastorno de aprendizaje" (respectivos en inglés). Se leyeron, se analizaron y se categorizaron los textos recuperados. Se identificaron: (a) Antecedentes históricos; (b) estructura; (c) efectos observados a la consolidación del modelo; (d) posibles contribuciones de la RTI a la educación brasileña. El sistema educacional brasileño puede enfrentar sus índices de fracaso y evasión escolar al adoptar la RTI. El modelo puede favorecer: (1) la prevención, por intermedio del monitoreo periódico del desempeño de los niños; (2) el carácter correctivo, al ofrecer tutoría. Se considera que discusiones sobre los efectos de la RTI son emergentes y necesarias, pues son relativamente recientes en Brasil, especialmente para consolidar la función de transformación social de los agentes educacionales.

**Palabras clave:** Respuesta a la intervención; dificultades de aprendizaje; fracaso escolar.

## *O Modelo RTI como estratégia de prevenção aos transtornos de aprendizagem*

### Resumo

Esta investigação buscou apresentar o modelo RTI, bem como sua pertinência e relevância como proposta efetiva e alternativa às bases curriculares brasileiras. Foi realizada uma revisão bibliográfica, que contemplou publicações científicas, nacionais e internacionais, desenvolvidas nos últimos 10 anos. Utilizaram-se como descritores: "resposta à intervenção", "educação" e "transtorno de aprendizagem" (respectivos em inglês). Os textos recuperados foram lidos, analisados e categorizados: (a) Antecedentes históricos; (b) estrutura do programa; (c) efeitos observados para consolidação do modelo; (d) possíveis contribuições da RTI à educação brasileira. O sistema educacional brasileiro pode enfrentar seus índices de fracasso e evasão escolar ao adotar a RTI. O modelo pode favorecer: (1) a prevenção, por meio do monitoramento periódico do desempenho das crianças; (2) o caráter corretivo, ao ofertar tutoria. Considera-se que discussões sobre os efeitos da RTI são emergentes e necessárias, pois são relativamente recentes no Brasil, especialmente para consolidar a função de transformação social dos agentes educacionais.

**Palavras-chave:** Resposta à intervenção; dificuldades de aprendizagem; fracasso escolar.

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# Introduction

We are in the 21st century, but the educational reality still reveals a large and growing number of children who have, to some degree, learning difficulties. Although, the proposals in the Common National Curriculum Base (BNCC) and National Curriculum Parameters (PCN) aim to determine the competences (general and specific) and the essential skills to be developed by students during each stage of education, as well as the guide for elaboration of teaching programs in order to promote quality education for all (Brasil, 1996), the results are not yet completely effective.

School failure is a recurring phenomenon in the Brazilian educational scenario that refers to an extensive network of educational phenomena, such as failure, poor performance, age-grade / year distortion and learning difficulties or learning disorder, which compromise the acquisition and development of socioemotional and cognitive skills. As a result, children with learning difficulties or learning disorders experience dropout, repetition, and behavioral problems. (Bossa, 2002; Zago, 2011).

Nationally, 30% to 40% of students in the early grades have some difficulty in the learning process. This represents 35% of the reasons for consulting pediatricians and responds to 45% of mental health care in the world. Approximately 25% of students have difficulties, mainly, for learning reading and writing skills (Almeida, Piza, Cardoso, & Miranda, 2016; Barbosa, Matar, & Piza, 2013).

Generally, the learning difficulties affects the acquisition, organization, retention, understanding or use of verbal or nonverbal information, causing some inefficiency in performing reading and writing activities, logical-mathematical thinking, among other skills required in the school context. They often occur during the acquisition or development of skills and may delay or reduce their achievement due to factors related to school, family and the learner himself. When the learning difficulty is neurobiological / constitutional in nature, heterogeneous and not determined by uncorrected sensory deficits, intellectual disability or inadequate instruction, it is known as Specific Learning Disability (SLD) (Cruz-Rodrigues, Barbosa, & Miranda; 2013; APA, 2014; Learning Disabilities Association of Canada, 2002; Machado & Capellini, 2014a, 2014b; Pestun, 2012).

In both cases, LD or SLD, the sociocultural variables that contribute to the students' failure at school are related not only to an unequal socioeconomic system, but also to teacher nonchalance in relation to their educational practice. A discourse of blaming the learner is recurrent. Faced with the failure of the learner, the teachers tend to exempt themselves from their responsibility by attributing to external variables in the teaching-learning process the cause for the students' failure. There is a difficulty in identifying, analyzing and modifying methodological and social actions in the classroom to promote learning of academic and citizenship skills (Pereira, Marinotti, & Luna, 2004; Skinner, 1968; Zago, 2011).

As a consequence of school failure, the losses experienced by children with LD or SLD are generally related to

poor academic performance, higher dropout rates, especially in high school, a reduction in higher education insertion rates, high levels of psychological distress, low overall mental health index, higher rates of unemployment and underemployment and lower income (APA, 2014, p. 73). Cruz-Rodrigues, Barbosa and Miranda (2013) also highlight that family members often report that children with SLD have severe socialization limitations and relationship problems with their peers and educators.

Given the severity and seriousness of the educational and socio-affective damages experienced by these children, identifying the origin of the problem is extremely important, to establish early measures aimed at minimizing and/or even extinguishing them. Prevention is identified as an extremely important factor in coping with SLD, due to the high probability of success in cases identified at its onset. Another contributing fact refers to the presence of greater neuroplasticity in the early years of childhood, "that is, the greater functional or structural adaptation that allows the acquisition of knowledge" (Almeida, Piza, Cardoso, & Miranda, 2016, p.613; Castro-Villarreal, Rodriguez, & Moore, 2014; Cicek, 2012; Fletcher, Lyon, Fuchs, & Barnes, 2007; Robertson & Pfeiffer, 2016).

However, in Brazil, the teaching model adopted focuses on the failure of the student to refer the intervention, with low (or zero) emphasis on prevention and early identification of SLD cases (Zago, 2011). Investments in programs that prioritize prevention and adequate intervention to children's deficits are observed, especially in the United States of America (USA). In this country, one of the key models of preventive-level intervention that has been most effective for learners is *Response to Intervention* (RTI) programs (Carta, Greenwood, Atwater, McConnell, Goldstein, & Kaminsk, 2015; Castro-Villarreal et al., 2014; Cheung, Mak, Sit, & Soh, 2016; Fuchs & Fuchs, 2006; Maier, Pate, Gibson, Hilgert, Hull, & Campbell, 2016; Robertson & Pfeiffer, 2016).

The RTI, although a procedure already consolidated in the US, is relatively new in Brazil. The model has emerged as a promising alternative to cope with this reality and is pointed by the literature as an effective resource for early identification of specific cases of SLD, including Dyslexia, and as a guide for interventions appropriate to the demands of each case (Brown-Chidsey & Steege, 2010; Carta et al., 2015; Castro-Villarreal et al, 2014; Ciullo, Lembke, Carlisle, Thomas, Goodwin, & Judd, 2016; Maier et al., 2016; Robertson & Pfeiffer, 2016; Stoiber, 2014).

This research consists of a theoretical study, which aimed to present the RTI model for the systems of regular education and inclusive education, as well as discuss the pertinence and relevance of this model to make the proposals that support the Brazilian curriculum bases. A bibliographic review was performed, through which national and international scientific publications developed over the last 10 years were analyzed, considering all the articles in the consulted databases, cataloged from 2007 to 2016. The consulted databases were PubMed; Capes Periodicals; LILACS; PePSIC and SciELO.

The survey was conducted from the combination of the primary descriptors: “response to intervention”, “education”, “learning disabilities”. It was established as a criterion for text selection the mandatory identification of the term RTI associated with at least one of the other descriptors in the title. The criterion of text retrieval consisted of reading the abstracts.

We selected 31 texts, theoretical and applied and retrieved 21 texts, objects of analysis. The materials are found in the references of this research. The selected texts were read, analyzed and categorized according to: (a) the historical antecedents of the model; (b) structure; (c) observed effects and impacts for model consolidation as a teaching proposal; (d) possible contributions of RTI to Brazilian education, formalizing the itinerary covered in this study.

## RTI model historical background

In recent years, in the US, the emphasis on learners' individual needs has provided context for adapting educational interventions that sought to address issues of students who were not meeting the educational proficiency standards outlined in the *No Child Left Behind* (NCLB) legislation. In contrast to that country's traditional education system, the RTI model has emerged as a proactive proposal focused on prevention and early intervention of academic and behavioral problems (Cicek, 2012; Fuchs & Fuchs, 2006; Grosche & Volpe, 2013; Maier et al., 2016; Robertson & Pfeiffer, 2016).

The RTI has proven to be an approach to addressing discrimination around the Intelligence Quotient (IQ) measure due to inconsistency in defining the discrepancy of these measures. The model emerged in response to widespread dissatisfaction with the diagnosis of children with learning disabilities, offered only after significant deficits in their intellectual capacity. RTI was developed with clear intentions to expose children to supplemental intervention immediately after identifying learning differences (Cicek, 2012; Fuchs & Fuchs, 2006; Grosche & Volpe, 2013; Maier et al., 2016; Robertson & Pfeiffer, 2016).

In general, the RTI model was defined as a preventive system through which data are collected to measure learners' development through evidence-based mechanisms. A preventive model that aims to improve the academic and behavioral performance of all students, as well as assist them with immediate difficulties (Cicek, 2012; Ciullo et al., 2016; Maier et al., 2016).

Initially two RTI proposals emerged: (1) standard treatment protocols that standardized the same validated treatment for children with similar academic problems. Protocols minimized ambiguity and favored decision making, but limited the scope for protocol variation and flexibility; and (2) problem-solving models, more complex than the standard protocol, in which a multidisciplinary team designed and implemented interventions based on the needs of each student, whose advantage was the sensitivity and flexibility of this model to individual learner differences. Aspects of both versions are combined by decreasing the cited dichotomy

(Cicek, 2012; Fuchs & Fuchs, 2006; Grosche & Volpe, 2013; Robertson & Pfeiffer, 2016).

In general, it is recommended to start with the standard protocol, increasing the intensity for the problem-solving model with individualized approach. Regardless of the RTI approach adopted, two components of the assessment process must be specified: (1) a method must be designed to measure students' responsiveness to instruction, (2) after conceptualizing responsiveness, a criterion must be applied to define the lack of response. According to this criterion, students are identified deficits (Cicek, 2012; Fuchs & Fuchs, 2006; Grosche & Volpe, 2013; Robertson & Pfeiffer, 2016).

However, there is still no consensus on how to define this criterion. This is of paramount importance because, as discussed earlier, RTI proposes an approach that fights the boundaries of IQ, especially the IQ achievement discrepancy, as a priority method for identifying learning disabilities. A variety of assessment procedures within an RTI framework can produce similarly unreliable diagnoses. For this reason, efforts should be employed to develop a common approach to defining and assessing non-response (Cicek, 2012; Castro-Villarreal et al., 2014; Grosche & Volpe, 2013; Robertson & Pfeiffer, 2016).

Despite its limitations, the RTI model is considered a strong and potential program, especially as it is structured in several layers that can be implemented from the early grades to reinforce the intensity and effectiveness of instructional activities for at-risk students and to avoid chronic school failure. This proposal establishes a differentiated curriculum and is promising for all students, not just students who are late. According to Maier et al. (2016, p.103) the RTI “represented the first and only moment when an important theoretical and methodological change was made regarding the identification of specific learning difficulties”.

## RTI: Structural aspects and model effectiveness.

The RTI is a program that has as its central objective to monitor the student's progress towards decision making based on teaching data. Information and data collected through RTI, with emphasis on differences in the learning process and meeting student needs, generally favor both an intervention / remediation aspect and, especially, a protective aspect (Harlacher, Potter, & Weber, 2015; Maier et al., 2016; Robertson & Pfeiffer, 2016; Spencer, Petersen, Slocum, & Allen, 2015).

Monitoring favors the early identification of children with real deficits who are publicly configured for special education services, minimizing student waiting time on the list of additional instructional assistance. It also contributes to reducing the total number of students referred to special education services who are mistakenly identified with SLD. RTI has been widely recommended for reducing the number of referrals to specialists by providing accurate instruction and high quality interventions in general education (Castillo, March, Stockslager, & Hines, 2015; Maier et al., 2016; Robertson & Pfeiffer, 2016).

The program establishes conditions for students to receive interventions as soon as teachers and parents identify any academic difficulties. If the child responds favorably to interventions, monitoring persists until the difficulty is extinguished. However, if the child does not respond to interventions that perform poorly in terms of educational attainment as expected, this failure to respond is conceptualized as an indicator of a specific learning disability and enables the child to be referred to child care services more intensive support. The RTI takes on a second function, that of diagnosis (Cicek, 2012; Maier et al., 2016; Robertson & Pfeiffer, 2016).

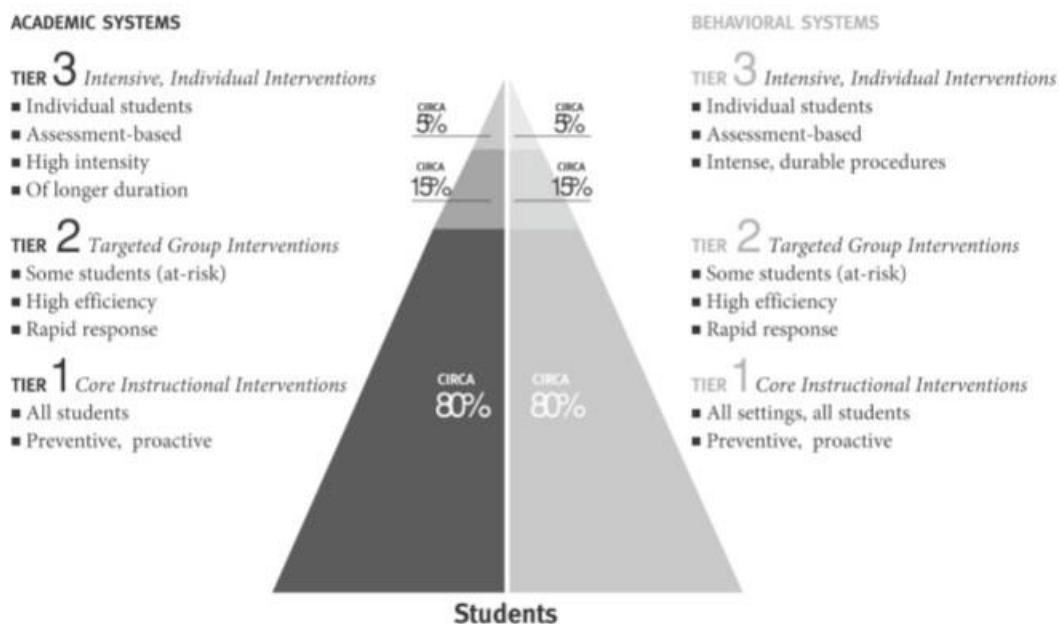
The program aims to: (1) provide differentiated instruction guided through reliable assessment and peer-reviewed, research-based interventions, responding to student needs; (2) monitor the learner's progress by recording the learning rate over time and performance level; and (3) make relevant educational decisions based on the deliberation of a multiprofessional team capable of solving the problem (Cicek, 2012; Castro-Villarreal et al., 2014; Ciullo, 2016; Maier et al., 2016; Robertson & Pfeiffer, 2016).

From the RTI model it is possible to: (a) identify and analyze the problem (collect baseline data); (b) generate hypotheses and possible intervention strategies; (c) draw up an intervention plan that clearly outlines procedures to be used during an intervention; (d) implement the data collection intervention plan; and (e) analyze / evaluate data, inform parents through frequent progress reports and revise plan as needed (Almeida et al., 2016; Cicek, 2012; Machado & Capellini, 2014a, 2014b; Robertson & Pfeiffer, 2016; Stoiber, 2014).

Because it is a multi-step approach, the RTI is configured in three levels of intervention. The form of intervention changes at each level, becoming more intense as a learner walks along the levels. The intensity of care is set as follows: (a) using more systematic, explicit teacher-centered instruction; (b) increasing the duration of this instruction; (c) organizing smaller and more homogeneous student groups; or (c) establishing tutorials with more experienced instructors (Cicek, 2012; Fuchs & Fuchs, 2006). Fletcher and Vaughn (2009) exemplified the organization of the RTI model in Figure 1 below:

In RTI models, all children receive classroom instruction (Level 1) and, through systematic assessment of their response to instruction, receive special and specialized intervention with increasing levels of intensity (Level 2 and / or Level 3) according to their needs. Focus on children's learning responses is measured by analyzing growth from one assessment point to another (Cicek, 2012; Ciullo, 2016; Spencer et al., 2015; Maier et al., 2016; Robertson & Pfeiffer, 2016).

The positive results (e.g. Cheung et al., 2016; Ciullo et al., 2016; Spencer et al., 2015) from the implementation of RTI have contributed to the effective consolidation of the model. Now, RTI is widely used in the US education system, growing exponentially, and represents the primary model of educational intervention. Because it is based on scientifically valid interventions, the RTI model is a reliable and consistent procedure that provides guidance for educational decision making, "including decisions on the effectiveness and intensity of instruction and intervention, eligibility for educational support programs and the elaboration of differentiated edu-



**Figure 1.** Model of academic and behavioral interventions at three increasingly intense levels. Percentages represent estimates of the number of children at grade level (Level 1) requiring services Level 2 and Level 3. Adapted from article entitled *Response to Intervention: Preventing and Remediating Academic Difficulties* (Fletcher & Vaughn, 2009, p. 11).

cational programs”(Almeida, et al., 2016, p. 613). Evidence-based interventions are increasingly becoming a necessity in the field of service delivery and public policy seeking to offer truly effective proposals to address target demands (Fallon, Collier-Meek, Maggin, Sanetti, & Johnson, 2015; Harlacher et al., 2015; Maier et al., 2016).

Recent research in the field of reading with Brazilian learners has shown positive effects of interventions based on RTI models (e.g. Almeida et al., 2016; Andrade, Andrade, & Capellini, 2013; Machado & Almeida, 2012, 2014; Machado & Capellini, 2014a, 214b; Silva, Luz, & Mousinho, 2012). The study by Machado and Almeida (2012) aimed to evaluate the reading speed of children submitted to stimulation workshops based on the RTI model. The results showed that the children benefited from the workshops. Improvement in reading speed was observed, suggesting the effectiveness of the intervention proposal based on RTI base elements.

The study by Machado and Capellini (2014a) sought to demonstrate the relevance of RTI for the dyslexia treatment. It aimed to analyze and compare the performance in reading and writing tasks in children diagnosed with dyslexia after tutoring intervention based on the RTI model. Fifteen children from a municipal school, aged 8 to 12 years old, participated in the study. They were distributed among the intervention group, 07 children; and the control group, 08 children. The results showed those children who were exposed to the intervention performed better in word and book reading tasks compared to children who were not submitted. The difference was statistically significant, suggesting the effectiveness of the RTI intervention

Researches have been developed to map RTI's contributions to teaching practice. In a study conducted by Castillo et al. (2015), the authors developed and performed an initial validation of an Intervention Response Belief Scale (RTI) - RTI Beliefs Scale of 16 items, which aimed to assess teachers' opinions, and beliefs about the suitability and functionality of the RTI model. The study had a sample that included 4,873 educators in 130 primary schools between 2007 and 2008. It was identified that the effects of the positive results achieved with the RTI seem to affect the adherence and engagement of educators in the intervention proposals, considering the threshold critical that educators' beliefs exert on intervention proposals. Accordingly, Castro-Villarreal et al. (2014) and Harvey, Yssel and Jones (2015) affirmed the importance of disseminating the RTI model, as well as other evidence-based proposals for teachers in order to foster understanding of its crucial role as an educational agent in the students' educational process. .

### **Possible contributions of the RTI model to Brazilian Education: A preventive proposal**

School failure is often a sign of an ineffective education system. An analysis of educational processes, specifically of the different networks of relationships that are established in the school context, points to a network of individuals

that influences the educational process and thus is subject to contingencies that must also be analyzed (Skinner, 1968).

Educational agents, as part of a system, determine the policy to be adopted and set the teaching objectives to be achieved. “Education is not only maintained by those who teach, but also by “those who organize the educational system” (Skinner, 1968, p. 227). The educational problems faced reflect difficulties inherent in the educational system, which, when prioritizing standardized teaching, ignores individual differences, that is to say the very uniqueness of its learners (Bossas, 2002; Skinner, 1968).

In order, the learning process becomes effective and enjoyable, it is necessary for these agents to establish a teaching proposal that allows the learner to walk at his own pace and extract meaning from the educational proposal (Skinner, 1968). The RTI proposal, when promotes a preventive as well as clinical aspect, it presents itself as an alternative that contemplates respecting the uniqueness of each student, their own rhythm, and can act by altering the negative value that education sometimes assumes for individuals. By opposing the unique static assessment, which is particularly biased because it disregards the diversity and plurality of social, cultural and economic variables, the proposal focuses on periodic monitoring of learners' performance (Cicek, 2012; Ciullo, 2016; Maier et al., 2016; Robertson & Pfeiffer, 2016).

The RTI model aims to meet legal requirements that favor the right to access to quality and assisted education. The positive results obtained in the USA suggest the effectiveness and effectiveness of RTI programs as a measure of prevention of SLD and justify the adoption of this model as an effective and consolidated educational resource (Cicek, 2012; Ciullo, 2016; Fuchs & Fuchs, 2014; Spencer et al., 2015; Maier et al., 2016; Robertson & Pfeiffer, 2016). Studies conducted in Brazil also demonstrate the effectiveness of the model for the success of interventions with children with SLD, especially with Dyslexia. The results of Brazilian research may indicate that the adoption of this proposal could be an effective strategy for coping with and preventing failure and dropping out.

Additionally, the RTI model would reinforce the objectives of the current National Curriculum Parameters, namely: 1) student motivation for learning in general, which mainly depends on the “history of school success or failure that the students bring and will determine the degree of motivation they will present in relation to the current learning, but it also depends on whether the content is meaningful and functional to them”; 2) teachers' orientation, making them aware that “diverse behaviors may be linked to the development of the same capacity, thus taking into account the diversity of students” (Brasil, 1997, pp. 48-49).

The emergence and consolidation of the RTI proposal is supported by two major points in the field of learning: (1) non-response to intervention; (2) prevention through early identification of children with learning disabilities (Almeida et al., 2016; Andrade et al., 2013; Machado & Capellini, 2014a, 2014b; Maier et al., 2016; Robertson & Pfeiffer, 2016).

Regarding the first item, non-response to the intervention, the RTI highlights the need for (a) continuous assessment of methodological variability and (b) search for evidence-based materials. As an educational proposal, it can contribute to teacher education by stimulating the monitoring of their own practice plus periodic evaluation of the student's performance, allowing recognizing the low sensitivity of learners and the relevance of programs at more intensive levels of intervention. Bossa (2002) states that one of the main educational problems faced is the lack of knowledge and unpreparedness of the educational agents, especially the teachers regarding the recognition of the relevance of developing a preventive approach, as well as their role in the intervention process.

As for the second point, prevention, RTI allows (1) early identification of children with indications of SLD and behavioral problems, (2) monitoring the development of children in the risk population to develop these difficulties and (3) providing appropriate and intensive interventions, based on the student's own response. The model can be a validation mechanism of established diagnoses, especially when learners do not respond adequately to interventions and as an effective strategy appropriate to the real needs of learners (Almeida et al., 2016; Andrade et al., 2013; Castro-Villarreal et al., 2014; Fuchs & Fuchs, 2006; Grosche & Volpe, 2013; Machado & Almeida, 2012, 2014; Machado & Capellini, 2014a, 2014b; Robertson & Pfeiffer, 2016).

## Final considerations

Discussions that address the effects of the RTI model are emerging and necessary as they are relatively recent in Brazil. Considering possible deficits in the promotion of a national policy for the prevention and monitoring of learners at risk of SLD, the importance of thinking about the structural aspects of RTI is resumed. The RTI can objectively outline a Brazilian educational proposal that includes the selection and fidelity of interventions, decisions on deadlines, criteria for movement between levels, as well as resources for interventions and training of school staff to promote an alternative to the usual national education system (Almeida et al., 2016; Machado & Almeida, 2014).

The Brazilian educational system can cope with its failure and dropout rates by adopting the RTI proposal as an effective and basic model of education. As a coping mechanism, the model can favor both (1) prevention through periodic monitoring of children's performance and (2) corrective character through the arrangement of activities that emphasize, for example, reading and writing tasks from a tutoring model that aims to reduce the failure of children with SLD.

Intervention programs based on the RTI model can facilitate multidisciplinary work and favor broader coverage of the goals set for AT cases. Measures to cope with educational system lags can be encouraged, as periodic assessments provide constant (re) assessment and accurate data

for learner condition analysis, as well as facilitating professional communication and consistency in therapeutic goals.

As protagonists of the teaching-learning process, educational agents should seek the best resources in order to provide students with conditions to overcome their difficulties and live positive experiences in relation to learning. Therefore, the adoption of the RTI program consolidates the social transformation function of educational agents by proposing: (1) a detailed analysis to establish appropriate teaching conditions; (2) measures to cope with stigmas centering on blaming children with learning disabilities (Castillo et al, 2015; Harvey et al., 2015; Pestun, Ciasca, & Gonçalves, 2002).

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