I'm still learning. A web platform for the intervention in reading disabilities

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Abstract

In 2014, 20% of the 4th graders had an unsatisfactory evaluation in the national exam of Portuguese language. This percentage is similar in the 6th and 9th grades indicating that a large number of Portuguese students have reading difficulties. The e-learning platform *"I'm still learning"* was developed to provide a systematic intervention with students (from 1st to 4th grade) experiencing reading difficulties. This free access platform provides a set of didactic sequences to promote phonological awareness, word reading, reading fluency and comprehension. Informal tasks for reading assessment are also included. In this paper we describe the platform and the theoretical framework adopted in its construction.

Keywords: Reading disabilities, assessment, intervention.

Introduction

1.1 Reading skills: implications for academic achievement, professional and career development, and civic and social participation

Reading skills serve as the foundation to acquire content knowledge in different domains (Lonigan et al., 2009; National Reading Panel, 2000), both in school and throughout life, influencing academic success during children's school years (Best, Floyd, & Mcnamara, 2008). On a lifelong perspective "poor literacy limits individuals' capabilities and civic participation, increases poverty, hinders innovation, reduces productivity and holds back economic growth" (European Comission, 2012, p. 21). Therefore the consequences of low literacy are a matter that concerns not just the individual but also the society as a whole. The 2012 report of the European Commission (pp. 23-25) identifies some of the reasons why reading literacy becomes increasingly important: (a) the digital world is centered on the written word; (b) the labour market requires high literacy levels; (c) social and civic participation are more literacy dependent and; (d) living longer requires the ongoing development of skills. The digital world in which children are now born requires better reading skills than in the past decades. Consequently, in the future, adults who are not proficient readers will be at a disadvantage (Torgesen, 2002). An effective intervention on reading difficulties in the early years of reading acquisition is therefore mandatory since this is a critical period in the development of reading skills (Best et al., 2008).

Research in the last decades has contributed to characterize reading difficulties, to set guidelines for assessment and intervention and to describe the necessary conditions for an effective intervention (Mathes & Denton, 2002; Torgesen, 2002). Regardless of these developments, some problems persist in ensuring that students with reading difficulties receive the intervention they need. Two important problems are: (a) the large number of children who experience these difficulties and (b) their heterogeneity. All children with reading difficulties require specific and intensive instruction (Scholin & Burns, 2012) and consequently specialized human resources and appropriate didactic materials. In order to overcome these issues, the digital environment is an outstanding tool for working with students with reading disabilities because it provides classroom teachers more support inside and outside the classroom to help struggling readers and it allows reaching a larger number of children (European Commission, 2012).

In this article we present a web-based intervention program called "I'm Still Learning" [AEA – *Ainda Estou a Aprender*] which was constructed to provide teachers with: (a) a theoretical foundation of literacy

learning, reading disabilities assessment and intervention; (b) informal tasks to assess phonological awareness, letter-sound correspondences, word recognition, reading fluency and comprehension; and (c) didactic, playful and enjoyable activities that can be chosen in order to plan an intervention program/curriculum that meets the needs of children with reading difficulties in grades 1 to 4. It aims at supporting the students of the first cycle of elementary education (grades 1 to 4) with reading difficulties.

This paper is organized into two sections. In the first section we present the model of the simple view of reading, we analyse the relationship between the components of the model and analyse its usefulness to characterize profiles of struggling readers and to organize the assessment and intervention. In the second section we describe the e-learning platform "I'm still learning".

1.2 The simple view of reading and the profiles of reading difficulties

According to the simple view of reading, (SVR, Hoover & Gough, 1990) reading is the product of two components: decoding and linguistic comprehension (LC). Decoding refers to "the ability to rapidly derive a representation from printed input" (Hoover & Gough, 1990, p. 130) and LC "is the ability to take lexical information (i.e., semantic information at the word level) and derive sentence and discourse interpretations" (Hoover & Gough, 1990, p. 131). The two components are necessary for reading success but none is a sufficient condition *per se* to ensure reading comprehension (Perfetti & Hogaboam, 1975).

Difficulties in decoding have been related with phonological awareness, i.e., the ability to attend to and manipulate the sounds in words (Stanovich, 1986). Research suggests that gains in phonological awareness leads to gains in reading (e.g. National Reading Panel, 2000; Snowling & Hulme, 2005). The relationship between phonological awareness and learning to read is associated with the ability to link phoneme awareness and letter knowledge (Hulme et al., 2002). When acquiring links between the two (the alphabetic principle), children become able to read (decode) new words. Children with reading difficulties demonstrate weaknesses in these skills (Snowling, 2000).

Fast and accurate word reading is mandatory, not only when words are presented in isolation, but also when embedded in connected text. Reading fluency, which is defined as "the ability to read a text quickly, accurately, and with proper expression" (National Reading Panel, 2000, p. 3-5), is a critical component of reading. A systematic relationship has been found between reading fluency and reading comprehension (Fuchs, Fuchs, Hosp, & Jenkins, 2001; Lane et al., 2008) at different grade levels (Kim, Park, & Wagner, 2014; Padeliadu & Antoniou, 2014; Valencia et al., 2010). Slow reading disturbs reading comprehension (Rasinski, 2000), given that the low reading rate makes children unable to retain the meaning of words they have read. The difficulty in reading isolated words is present in a large number of children with reading problems. In some cases these problems are thought to be related with an underlying phonological processing deficit, with children experiencing a great difficulty in using the alphabetic principle to decode words accurately and efficiently: decoding is slow and laboured and, consequently, it has a negative impact on reading comprehension (Fletcher et al., 2002). The influence of decoding on reading comprehension has been explained on the basis of the attentional resources that the reader possesses. According to Laberge and Samuel (1974) the attentional resources are limited. If a child must use them in decoding, there will be few attentional resources available to execute the higher-order processes involved in reading comprehension. There are evidences of differences in word reading between skilled and less skilled comprehenders, and one of the reasons suggested by Perfetti and Hogaboam (1975) is that less skilled readers' word reading is underdeveloped and less automatic, consequently they "require more of the limited capacity needed for the higher processes of comprehension" (p. 467).

Poor language comprehension can be present in children with normal phonological processing skills. Despite being able to decode, these children demonstrate difficulties in comprehending what they listen or read. A third group of children experiences simultaneously difficulties in decoding and in comprehension (Mathes & Denton, 2002).

The program "I'm still learning": an online platform for the assessment and intervention in reading disabilities

Reading fluency (whether considering isolated word reading or connected text reading), linguistic comprehension and reading comprehension influence each other. Several studies provide evidence of the complex pattern of relationships between these reading skills across school grades (Cain & Oakhill, 2006; Kim, Wagner, & Lopes, 2012; Nation & Snowling, 2000; Petscher & Kim, 2011; Stanovich, Cunningham, & Feeman, 1984).

Considering the SVR framework, students with reading difficulties may have different profiles: a) poor decoding coupled with poor linguistic comprehension; b) poor linguistic comprehension without problems in decoding; and c) poor decoding without problems of linguistic comprehension (Duff & Clarke, 2011). This description does not consider the aetiology of reading difficulties (for a review, see Elliott & Grigorenko, 2002)

nor other factors, in addition to fluency and listening skills, that influence reading comprehension, such as vocabulary, working memory, reasoning or rapid automatic naming (Norton & Wolf, 2012; Ouellette, 2006; Perfetti & Hogaboam, 1975; Ribeiro, Cadime, Freitas, & Viana, 2015). However, it is particularly useful for planning an evaluation and intervention focused on reading skills, and it was, therefore, used in the elaboration of the platform "I'm still learning".

The e-learning platform intends to provide teachers with a set of assessment materials and intervention activities for children with learning difficulties aimed at improving struggling readers' skills. The designation adopted reflects a set of principles and options: (a) the goal is to help students with reading difficulties switch from a narrative that highlights personal failure, to a view that emphasizes the idea that learning to read is an ongoing process; (b) the open-access platform provides teachers, parents and students a set of materials and activities that allow the evaluation of reading skills and the selection of a set of tasks that can help students overcome their reading difficulties. All the activities and material are available online and can be accessed at school or at home by teachers, parents or students. It is expected that teachers select the activities that are more appropriate to each student's needs. Consequently, intervention is individualized and there is the possibility to continue at home the work done at school; (c) "Assessment" is conducted under the framework of the Curriculum-Based Assessment (Deno, 2003). Although standardized tests can be used to assess the students' reading skills (Cadime, Ribeiro, Viana, Santos, & Prieto, 2014; Cadime, Viana, & Ribeiro, 2014; Cadime et al., 2013; Chaves-Sousa, Ribeiro, Viana, Vale, Santos, & Cadime, 2015; Carvalho, 2010; Ribeiro, Viana, Santos, Cadime, Chaves-Sousa, Vale, & Spinillo, 2014; Santos et al., 2015; Sucena & Castro, 2008, 2012; Viana et al., 2015; Viana, Ribeiro, Maia, & Santos, 2006) we chose to provide assessment materials similar to those used in the instructional settings. A classification of the students is not required (e.g., dyslexic, poor comprehenders, etc.), but a description of the skills where training is required is needed instead (phonological awareness, word reading, oral reading fluency and comprehension). This assessment will allow the teacher to select the activities of intervention from the ones available in the platform in order to individualize each student's intervention, to monitor student's progress and evaluate the efficiency of the intervention. Evaluation is, therefore, conducted under the perspective of "assessment for intervention". Because students can access the activities and material in different settings and according to a plan specifically designed for them, three requisites of effective intervention are met: a systematic, individualized and integrated approach (Outón, 2004). The intervention includes a set of tasks aimed at developing phonological awareness, fluency in reading isolated words and texts and comprehension (listening and reading).

The platform is composed of three panels (cf. Fig. 1): a) a review of literature on reading disabilities *(Knowing more)*; b) curriculum-based measures of reading *(I already know)* and; c) computer assisted reading activities *(Learning more)*. The platform was designed to allow modifications and updates of its contents and the introduction of new materials and activities.

2.1. Knowing more

The panel "Knowing more" presents the theoretical background and framework for assessment and intervention. The platform is free access but to use the resources available in the panel "I already know" and "Learning more" it is necessary to make a registration. This requirement is not necessary to consult the panel "Knowing more". In "Reading Disabilities" (cf. Fig. 1) the concept of reading disabilities, classificatory issues, the prevalence of reading disabilities and the long term effects of reading disabilities are discussed. The second section *"The platform "I'm still learning"*, provides general information regarding the major goals of the platform, how to access, the target population and implementation. In the section *"Assessment: I already know"* issues related with the assessment of reading difficulties and the options made in the construction of the tasks are addressed. Moreover, the following questions are discussed: where to start with the evaluation? Is it mandatory to do the assessment before starting the intervention process? Is it necessary to assess all the reading skills included in the platform? Is the evaluation organized per school grade? Can an evaluation be interrupted and then restarted? Is it possible to repeat the application of the assessment tasks? Where is the evaluation made? What information is obtained at the end of the evaluation? How can the results of the evaluation be accessed?

The section "Intervention: learning more" includes a review of the guidelines for an effective intervention in reading difficulties. Information regarding the resources available in the panel "Learning more" is also provided. Answers are given to the following set of questions: Does the platform allows to individualize the intervention? How are the intervention activities selected? Can a student work on activities related with different reading skills (e.g. fluency and listening comprehension)? What is the sequence for the activities? How can we monitor the student's progress? In sections 5 to 10 (phonological awareness, letter naming, production of syllables and diphthongs, word recognition, oral reading fluency and comprehension) we present a definition of the concepts and analyse the relationship between the skills and their particular contribution to reading comprehension.
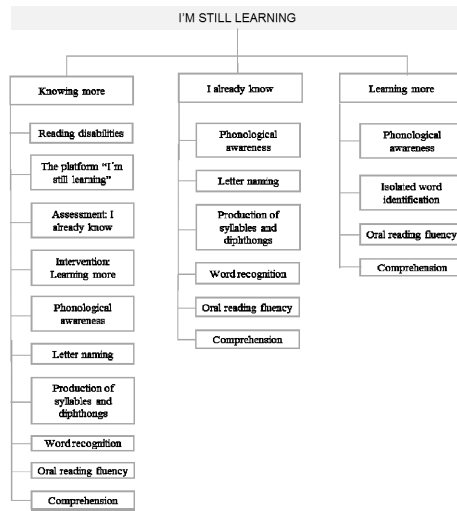
Fig. 1. Structure and major panels of the platform "I'm still learning"

2.2. I already know

The evaluation process was planned to allow teachers to obtain information regarding the reading strengths and weaknesses of the students. The purpose of the assessment is: (a) to plan the instruction and the development of an intervention plan adjusted to the students' needs; (b) to measure progress over time and; (c) to determine if the intervention is effective. Children should be actively involved in the evaluation process and in the definition of the specific reading goals that they should achieve, so it is important to share with them the results of their evaluation, describing the skills and knowledge already acquired and those where further training is required. Assessment is organized in the panel "I already know" and intervention in the panel "Learning more". The choice of the topics was done in order to convey an approach that does not emphasizes failure, instead we help children to construct a personal narrative that emphasizes "there are things" they know and other things that they must learn. This option is compatible with the philosophy that guided the development of the web platform "I'm still learning".

We privileged the assessment of the skills that we aim to improve via the intervention, namely phonological awareness, word reading, oral reading fluency and comprehension. We recognize the relevance of using a heuristic model of assessment (Fletcher et al., 2002) that comprises not only the description of the problems that characterize students' difficulties but also students' traits (cognitive or psychosocial), environmental variables and biological variables. However, the assessment of these dimensions is beyond the teacher's role and skills. Consequently, we provide instructions in the platform for teachers to request for a specialized assessment if they find it necessary, but we maintain the indication to evaluate reading difficulties. In this sense our approach is aligned with the one of Elliot and Grigorenko (2002): "In respect to pedagogy, however, the crucial task is to identify the individual reading strengths and weaknesses and address these directly" (p.165).

Different classifications of reading disabilities have been proposed along the last decades (Elliott & Grigorenko, 2002; Snowling & Hulme, 2005) with implications in the diagnostic of reading disabled children. However, classifying children in a particular category is not a goal in this project. Instead, the goal is to help teachers to describe children's difficulties in order to plan an intervention.

Fig. 1 presents the major skills that are assessed: phonological awareness, letter naming, production of syllables and diphthongs, word recognition, oral reading fluency and comprehension. It is not mandatory that the evaluation process follows the order shown in the platform. The teacher's knowledge about the difficulties the student has may be considered when deciding where to start the assessment. Once the assessment is completed, a qualitative report describing the strengths (I already know) and the weaknesses (Learning more) is generated by the platform. This report should be discussed with the student in order to define educational goals adjusted to his needs.

2.3. Learning more

Evidence suggests that certain instructional approaches are equally effective for children with reading difficulties and typically developing children (National Reading Panel, 2000) and that intervention should supplement and not replace general classroom literacy instruction (Torgerson, Brooks, & Hall, 2006). However, in the intervention with children with reading difficulties: a) skills must be taught more directly; b) training must

include more learning opportunities and work in small groups; and; c) the tasks should include more support (Duff & Clarke, 2011). These aspects were attended in the construction of the intervention in the platform.

The platform was designed to allow the development of an individualized and systematic intervention. Each student can follow a distinctive sequence of training, depending on their own pattern of difficulties. The start and the sequence of activities (panels) are differentiated for each student depending on the results of the initial assessment and of the monitoring that spans through time.

Each student's progress can be monitored by accessing: a) the results of each student in the proposed activities of each panel; b) the materials used in the initial assessment to monitor changes throughout time. Each student needs a computer with internet access, printed materials, microphone and headphones. Activities should take between 15 to 30 minutes per session. Moreover, to ensure a systematic training, the sessions should be implemented on a daily basis. Activities can be performed at school and at home. Doing activities at home is actually important to consolidate the training.

Acknowledgments

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