

# Reading and writing of the words in children in the 4<sup>o</sup> year of elementary education post remote education: comparison between public and private networks

Leitura e escrita de palavras em crianças do 4<sup>o</sup> ano do ensino fundamental pós ensino remoto: comparativo entre redes pública e privada

Lectura y escritura de palabras en niños de 4<sup>o</sup> año de educación primaria pos educación remota: comparación entre redes públicas y privadas

Ana Paula Rigatti-Scherer<sup>1</sup> 

Mayara Batista Pereira Pinheiro<sup>1</sup> 

Marcia de Lima Athayde<sup>1</sup> 

## Abstract

**Introduction:** Literacy is the process that involves the exchange of information between teachers and students, focusing on the objectivity of learning, encompassing the acquisition of fundamental skills in reading, writing and understanding the alphabetic system. The school's adaptation during the pandemic brought with it limitations for remote teaching. **Objective:** To compare and describe performance in reading and writing words among students in the 4th year of elementary school in public and private schools. **Methods:** Cross-sectional observational study, linked to the Universidade

<sup>1</sup> Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil.

### Authors' contributions:

APR-S: orientation; collection and revision.

MBPP: collection; literature revision; results and discussion.

MLA: text revision and contributions on methodology.

**Email for correspondence:** [rigatti.scherer@gmail.com](mailto:rigatti.scherer@gmail.com)

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Federal do Rio Grande do Sul project “School performance, anxiety at school and emotional regulation in children in the 4th year of elementary school after remote education”, which investigated the reading and writing performance of students in 4th year of Elementary Education in public and private schools. With 77 participants (34 public, 43 private), the School Performance Test - Second Edition (TDE-II), writing and reading subtests were used for evaluation. **Results:** Private schools showed higher averages (31.86 writing, 35.13 reading) compared to public schools (27.67 writing, 33.58 reading). There was a statistically significant difference between the networks, however no student obtained all correct answers in the written subtest. **Conclusion:** There is a significant difference in performance in reading and writing words between students from public and private schools, indicating a worrying deficit in writing and reading in the initial post- pandemic years. Sudden changes in teaching methods and the transition to remote learning may have contributed to these disparities. Identifying these deficits contributes to implementing effective interventions.

**Keywords:** Literacy; Returning to school; Covid-19.

### Resumo

**Introdução:** Alfabetização é o processo que envolve a troca de informações entre professores e alunos, com foco na objetividade do aprendizado, abrangendo a aquisição de habilidades fundamentais de leitura, escrita e compreensão do sistema alfabético. A adaptação da escola durante a pandemia de COVID 19 trouxe consigo limitações para o ensino remoto. **Objetivo:** Comparar e descrever o desempenho em leitura e escrita de palavras entre estudantes do 4º ano do Ensino Fundamental de escolas públicas e privadas. **Métodos:** Estudo observacional de corte transversal, vinculado ao projeto “Desempenho escolar, ansiedade na escola e regulação emocional em crianças do 4º ano do Ensino Fundamental pós ensino remoto” da Universidade Federal do Rio Grande do Sul, o qual investigou o desempenho em leitura e escrita de palavras de alunos do 4º ano do Ensino Fundamental em escolas públicas e privadas. Com 77 participantes (34 públicas, 43 privadas), utilizou-se aplicação do Teste de Desempenho Escolar - Segunda Edição (TDE-II), subtestes escrita e leitura para avaliação. **Resultados:** Escolas privadas mostraram médias superiores (31,86 escrita, 35,13 leitura) em comparação com escolas públicas (27,67 escrita, 33,58 leitura). Houve diferença estatisticamente significativa entre as redes, no entanto nenhum estudante obteve totalidade de acertos no subteste escrita. **Conclusão:** Há diferença significativa no desempenho em leitura e escrita de palavras entre escolares da rede pública e privada indicando um preocupante déficit em escrita e leitura nos anos iniciais pós-pandemia. As mudanças bruscas nos métodos de ensino e a transição para ensino remoto podem ter contribuído para essas disparidades. A identificação desses déficits contribui para implementar intervenções eficazes.

**Palavras-chave:** Alfabetização; Retorno à escola; Covid-19.

### Resumen

**Introducción:** La alfabetización es el proceso que implica el intercambio de información entre profesores y estudiantes, centrándose en la objetividad del aprendizaje, abarcando la adquisición de habilidades fundamentales en lectura, escritura y comprensión del sistema alfabético. La adaptación de la escuela durante la pandemia trajo consigo limitaciones para la enseñanza remota. **Objetivo:** Comparar y describir el desempeño en lectura y escritura de palabras entre estudiantes de 4to año de educación básica de escuelas públicas y privadas. **Métodos:** Estudio observacional transversal, vinculado al proyecto “Rendimiento escolar, ansiedad en la escuela y regulación emocional en niños de 4to año de educación primaria después de la educación remota”, que investigó el rendimiento en lectura y escritura de estudiantes de 4to año de secundaria. Educación Primaria en colegios públicos y privados. Con 77 participantes (34 públicos, 43 privados), se utilizó para la evaluación la Prueba de Desempeño Escolar - Segunda Edición (TDE-II), subpruebas de escritura y lectura. **Resultados:** Los colegios privados mostraron promedios más altos (31,86 en escritura, 35,13 en lectura) en comparación con los públicos (27,67 en escritura, 33,58 en lectura). Hubo diferencia estadísticamente significativa entre las redes, sin embargo ningún estudiante obtuvo todas las respuestas correctas en la subprueba escrita. **Conclusión:** Existe una diferencia



significativa en el rendimiento en lectura y escritura de palabras entre estudiantes de escuelas públicas y privadas, lo que indica un déficit preocupante en escritura y lectura en los años iniciales pospandemia. Los cambios repentinos en los métodos de enseñanza y la transición al aprendizaje a distancia pueden haber contribuido a estas disparidades. Identificar estos déficits contribuye a implementar intervenciones efectivas.

**Palabras clave:** Alfabetización; Regreso a la escuela; Covid-19.

## Introduction

Insertion into a literate culture depends on the acquisition of reading and writing skills, which occurs through the literacy process. Although formally initiated in school, literacy begins much earlier, through contact with written materials and other opportunities that children experience from birth. Literacy is understood as a process that involves the exchange of information between teachers and students, focusing on the objective learning necessary for students and encompassing the acquisition of fundamental skills in reading, writing, and understanding the alphabetic system of a language<sup>1</sup>.

Thus, literacy is not limited to a specific moment in school life, as children brings a set of knowledge developed since their initial exposure to the literate world. For a more formal learning of reading and writing (a conscious process of knowledge acquisition), the student needs to understand different aspects of language to advance toward reading comprehension and text production. The acquisition of reading and writing abilities, which is a process of implicit nature, involves gradual, extensive and co-dependent processes in different stages<sup>2</sup>.

One of the skills developed in the process of learning to read and write is phonological awareness. This refers to the ability to understand that speech can be divided into smaller parts that can be manipulated. This skill develops gradually as the child becomes aware of the sound system of the language, understanding words, syllables, and phonemes as separate and identifiable units<sup>3</sup>, which is essential for literacy. Studies indicate that children presenting well-developed phonological awareness tend to perform better in the literacy process.

Ehri<sup>4</sup> proposes a set of phases during the learning of reading and writing based on the understanding of the grapheme-phoneme relationship, that is, the understanding that letters represent sounds. The

development of these skills occurs in progressive stages, starting with the pre-alphabetic phase, characterized by an initial stage in which students imitate adult writing, but do not yet fully understand the correspondences between letters and sounds.

Next is the partially alphabetic stage, with a growing understanding that letters represent sounds, but children still do not fully master the complex rules of the alphabetic system. The next stage is the fully alphabetic, where children achieve complete mastery of the correspondences between letters and sounds. Finally, the consolidated alphabetic stage, where spelling rules are established in writing, reading becomes automated, and there is awareness of the morphological structure of words. These stages are necessary in the literacy process, preparing children to become competent readers and writers throughout their educational journey.

The correlation between phonological awareness and the process of learning to read and write is widely explored in academic studies. Rigatti-Scherer<sup>5</sup> emphasizes the reciprocal nature of this relation, highlighting that phonological awareness not only facilitates the acquisition of writing skills but is also benefited by the process of learning to write, contributing to the expansion of this skill. As previously described, competence in identifying speech sounds is crucial for overcoming challenges related to reading and writing, also considering the inverse possibility: learning to read and write in an alphabetic system drives the development of phonological awareness, especially in the segmentation of speech into phonemes<sup>6</sup>. We point out that this interconnection is essential, because effective phonological processing is basic for the development of reading and writing skills. The use of activities focused on phonological awareness, such as rhyme, syllable, and phoneme perception, is identified as an effective means to anticipate significant gains in the development of these skills<sup>7</sup>, serving as important prerequisites in the literacy process.

Problems in learning to read and write can result from failures at different stages of process-



ing and handling linguistic information, as well as from changes in the teaching format and possible limitations in the resources and materials used. The COVID-19 pandemic<sup>8</sup> affected the teaching format, especially for students in the process of literacy. Global social distance measures were implemented to contain the spread of the virus, leading to the closure of both public and private schools, with the interruption of in-person classes<sup>9</sup>. In this context, the initial response of the Ministry of Education (MEC) was to suspend classes, as per Ordinance No. 343 of March 17, 2020, forcing education systems to seek strategies to face this challenge<sup>10</sup>. Later, the National Council of Education (CNE) approved guidelines directing basic education schools on practices to be adopted during the pandemic. These guidelines included the suggestion of technological alternatives to maintain school activities, aiming to prevent inequalities, school dropout, and repetition, with an emphasis on the continuous offering of activities starting from early childhood education<sup>11</sup>.

Many changes occurred in education, revealing difficulties for parents in monitoring activities, the adaptation of teaching practices by teachers, and a lack of appropriate resources for students and schools. This situation brought about significant challenges in public education, especially in Brazil, where educational policies often do not appropriately address the needs of vulnerable populations, highlighting the precarity in education and making current difficulties even more evident. According to data from the 2018 Programme for International Student Assessment (PISA), the levels of reading and text comprehension skills in Brazil had already stagnated over the past decade, reaching only the basic level of understanding. In Porto Alegre, the 2019 Basic Education Development Index (IDEB) was 4.9 in the early years, far from achieving the goal of 5.6. In this context of social inequality and limited opportunities, present even before the pandemic, differences in the learning of students in public and private schools - mainly in terms of resources - became even more evident.

During the pandemic, it became necessary to use electronic devices and computers, internet connectivity, learning engagement, and family and school support and monitoring, among other aspects.

In addition to the exacerbation of challenges, the prevention of virus contamination hindered

socialization, which is fundamental for learning. The adaptation of schools to the pandemic context, with remote learning was necessary, but brought inherent limitations due to the nature and culture of schooling, which could not simply be transferred to the virtual environment. Linhares and Enumo<sup>12</sup> emphasize that the school, as a second essential ecosystem for human development and learning, is crucial, and that its absence results in significant impacts, particularly in the deprivation of social interaction and essential learning for children's development.

Our purpose was to demonstrate the levels of reading and writing learning in students from public and private schools after the remote learning period, this study attempted to assess and compare these skills among 4th-grade students from both education networks who started literacy during the pandemic. The hypothesis was that the results were below those observed before the pandemic, and presented significant differences between public and private schools.

## Materials and Methods

This is an observational, cross-sectional study with a quantitative approach. It is part of the project entitled "School Performance, School Anxiety, and Emotional Regulation in 4th Grade Elementary School Children Post-Remote Learning," from the Speech-Language Pathology Program at Phonaudiology Course of Universidade Federal do Rio Grande do Sul. The project was approved by the Ethics Committee under opinion number 6.298.989.

Participants in this research included 4th-grade elementary students aged 9 to 10 years from two public schools and two private schools, selected for their convenient location, both near the Health Campus of Universidade Federal do Rio Grande do Sul in Porto Alegre/RS. A total of 77 students were evaluated (34 from public schools, and 43 from private schools).

The educational institutions were invited to participate in the project and signed the Acceptance Agreement. Parents and/or guardians signed the Informed Consent Form (ICF), and the participants signed the Assent Form (AF) for the research.

To assess reading and writing performance, the School Performance Test - Second Edition (TDE II), specifically the Reading and Writing Subtests, was used as outlined below (STEIN; GIACO-





MONI; FONSECA, 2019)<sup>13</sup>. TDE II assesses basic skills in reading, writing, and arithmetic and can be used for universal screening, diagnostic assessment, and guiding clinical intervention planning. The target audience for this instrument includes children from 1st to 9th grade in public and private schools.

- a) Reading Subtest of TDE II - assesses the reading of isolated words. Version A (Cronbach's alpha = 0.86), which contains 36 words, was used and is applied to students from 1st to 4th grade. Each student was asked to read the 36 words aloud, with only their voice being recorded. The number of errors, number of attempts, and time taken for reading were recorded. Items were scored dichotomously: 1 - correct; 0 - incorrect.
- b) Writing Subtest of TDE II - assesses the writing of isolated words. Version A (Cronbach's alpha = 0.98), which contains 40 words varying in complexity, was used. This version is applied collectively to students from 1st to 4th grade.

For the dictation, students used pencils and the answer sheet for the subtest. They were instructed not to use erasers; if necessary, they could circle the incorrect word and rewrite it, with circled words excluded from the scoring. Any deviation from the correct spelling was considered an error, including phoneme-grapheme conversion errors, contextual rule errors, language irregularities, and word-level errors. This subtest allows for both quantitative scoring (correct or incorrect) and qualitative analysis, which examines error types: phoneme-grapheme conversion, contextual rules, language irregularities, and word-level errors. For this study, only quantitative analysis was used.

For data collection, the evaluation team consisted of seven undergraduate students in Speech-Language Pathology and Psychology - a speech-language pathologist, a psychologist, and the project coordinator, a speech-language pathology professor. After the necessary consent forms were signed, data collection was organized in accordance with the class teachers. First, a collective session was held in the classroom with each class, during which the Writing Subtest of the TDE II was applied. Next, students were individually called to a private location for the application of Reading Subtest of the TDE II.

The individual (Reading Subtest) and collective (Writing Subtest) applications of the TDE II followed the guidelines outlined in the instrument's

manual (STEIN; GIACOMONI; FONSECA, 2019). The evaluation team underwent training prior to data collection to receive instructions for applying the Subtests. Initially, rapport was established before the application of each Subtest. In the case of the Writing Subtest, all words were dictated twice. If the examinee requested repetition, he was instructed to write the word as he understood it. For the Reading Subtest, the examiner pointed to the order in which the examinee should read the words on the stimulus sheet. All responses were recorded on the TDE II answer protocols.

Initially, descriptive statistical analyses were performed to characterize the groups. Measures of central tendency (mean) and dispersion (standard deviation), as well as minimum and maximum values, were described. These analyses were conducted using data from all the children, and they were also stratified by school network (public school group and private school group).

To compare the results between groups, a normality test was initially performed on the data. Subsequently, the independent samples t-test was applied. Differences were considered significant when  $p < 0.05$ . The analyses were conducted using the SPSS statistical software, version 25.0.

## Results

For this study, 77 students were evaluated, with 34 from public schools and 43 from private schools, aged between 9 and 10 years (mean = 9.53 years). In public schools, students had a mean score of 27.67 (standard deviation = 7.13) on the Writing Subtest of the TDE II. Regarding the Reading Subtest of the TDE II, the mean score was 33.58 (standard deviation = 2.89). In the private school group, the mean score on the Writing Subtest of the TDE II was 31.86 (standard deviation = 4.78). For the Reading Subtest of the TDE II, the mean score was 35.13 (standard deviation = 1.18). It is noteworthy that there was no ceiling effect on the Writing Subtest of the TDE II in either public or private schools, as none of the students from the participating schools, regardless of school type, correctly answered all the words on the TDE II - Writing.

When comparing the results of the assessments in the Writing and Reading subtests of the TDE II between public and private schools, a significant difference was found between the two types of

schools (Table 1). As for writing, there was a significant difference ( $p = 0.018$ ) between public and private schools, with a medium effect size (Cohen's  $d = 0.69$ ), noting that an effect size above 0.80 is

considered large. As for reading, there was also a significant difference ( $p = 0.000$ ) between public and private schools, with a medium effect size (Cohen's  $d = 0.70$ ).

**Table 1.** Comparison of the mean scores of the Writing and Reading Subtests between public and private schools.

	Escolas públicas			Escolas privadas			P value
	N	$\bar{x}$	$\pm DP$	N	$\bar{x}$	$\pm DP$	
TDE II Writing	34	27.67	7.13	43	31.86	4.78	0.018*
TDE II Reading	34	33.58	2.89	43	35.13	1.18	0.000*

N: number of participants;  $\bar{x}$ : mean;  $\pm DP$ : standard deviation; p: significance level

## Discussion

For the formal learning of reading and writing, students need to master various aspects of written language, such as encoding and decoding, reaching text comprehension. However, changes in teaching formats, especially during the COVID-19 pandemic<sup>14</sup>, had a negative impact on the development of these skills, mostly for students who began literacy education through remote learning<sup>(15)</sup>. When evaluating word reading and writing, it was observed that this skill was impaired in both types of schools.

Both public and private schools faced challenges as the pandemic significantly altered education in the country and worldwide<sup>16</sup>. However, the performance between public and private schools showed differences. For instance, in 2019, in the state of Rio Grande do Sul, where public schools had already lower rates compared to private schools (Ideb 4.2 for public schools and 6.1 for private schools)<sup>17</sup> due to remote learning imposed by the pandemic, these differences became even more pronounced. The better results observed in private schools can be attributed to factors such as accessibility, including the availability of modern educational materials, smaller class sizes, and an environment more suitable to the development of reading skills.<sup>18</sup>

Although private schools have greater resource availability, this condition did not automatically ensure the quality of education. Students faced challenges regardless of resources available.<sup>19</sup> This

explains why both types of schools were negatively impacted by the pandemic.

In the post-pandemic context, the performance gaps between public and private schools have proven to be significant, influenced by a range of multifaceted factors. These include the global need for incorporating digital technologies into teaching practices, the transition to remote learning, and the challenges associated with this adaptation<sup>(20)</sup>, as mentioned earlier in this study. Equity in access to technological resources and the quality of educational platforms used are also factors that may unevenly affect public and private institutions.<sup>21,22</sup>

## Conclusion

In the initial post-pandemic years, there has been a concerning incidence of deficits in writing and reading skills, outlining a significant challenge in the educational scenario. Sudden changes in teaching methods, including the transition to remote learning, may have contributed to differences in the development of these fundamental skills. Identifying these deficits is crucial for implementing effective interventions, not only to address academic setbacks, but also to adapt educational approaches to meet the specific needs of students in the post-pandemic context.

The findings of this study show the importance of this issue and contribute to advancing knowledge in the fields of language, education, and health during this new period. Furthermore, the results highlight the need for both quantitative

and qualitative research to deepen the understanding of post-pandemic educational dynamics and their consequences.

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