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Educational Games for the Development of Reading and Writing in Students with Learning Difficulties: Proeduca Program[1]

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Brazil has many students who are behind in reading and writing. Officially, according to the Brazilian Institute of Geography and Statistics, the number of illiterate children increased from 1.4 million in 2019 to 2.4 million in 2021. In this scenario, learning to read and write is a concern. The research presented here highlights a proposal for intervention through educational games that aims to provide a playful, interactive form of teaching, based on specific content and produced at low cost. The proposal with educational games is based on national and international research that indicates that games can mobilize knowledge and consolidate learning, as well as improving overall performance in writing and reading. This work presents the results of an intervention project through educational games carried out in a classroom with 21 students enrolled in the 1st year of elementary school. The project involves the development, production and application of games in the classroom. The focus of the entire project was to improve reading and writing comprehension levels among elementary school students. The games are produced at the university, based on the curricular content that needs to be taught. The project is being developed with financial support from the São Paulo Research Foundation (FAPESP) under the program to improve public education – PROEDUCA. The results show that children are more involved in school activities, that the games provide better moments of interaction in the classroom and result in effective learning, since they are a different way of approaching teaching content. Better reading and writing scores were observed among children. It is worth noting that the educational games produced directly involve the teaching and learning processes of the curricular components – in this case reading and writing – and are considered teaching methodologies. Regarding the Sustainable Development Goals (SDGs) linked to this project, we have 4 – Quality education, and 10 – Reduction of inequalities. Research contributes to improving Public Education, promoting the articulation between theory and practice in the educational context with a view to consolidating the teaching, research and university extension tripod and promoting a humanized education.

Keywords: *Intervention. Learning. Playful. Teaching. Interaction.*

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Introduction

Literacy is an extremely important phase for students, their parents and schools, as it constitutes a fundamental learning process not only for the student's continued presence in school, but also for their integration into a society that is immersed in the literate culture. Thus, the difficulties that some students have in acquiring reading and writing skills during this period generate concern for teachers, parents and the children themselves. Brazil still faces the problem of students who reach the 3rd year of elementary school without mastering basic reading and writing skills, such as: independent reading of different text genres; inference in reading; the production of different texts for different purposes; the correct use of punctuation in text production; the use of conventional spelling in different text productions and the use of diverse vocabulary appropriate to the text genre.

By recognizing the difficulties faced by teachers who are faced with the task of teaching their students to read and write, we propose, in this text, to reflect on some concepts regarding the use of some resources, such as the use of educational games, which can help teachers organize the teaching process and make learning to read and write more enjoyable for students. The text discusses the relevance of including educational games in the context of literacy and also demonstrates how this resource can be useful to teachers in planning actions within the scope of literacy.

It is important to contextualize the importance of the funding received for this research from the São Paulo State Research Support Foundation – FAPESP, which is a public institution of the government of the state of São Paulo, Brazil, which aims to promote scientific and technological research in the state and to this end offers scholarships and grants to researchers in various areas of knowledge.

The article presented here competed, among other projects, and was one of the eight selected in the PROEDUCA FAPESP program, whose main objective is to support the development of public policies and pedagogical approaches that aim to improve learning, reduce educational inequalities and adopt innovative pedagogical approaches that aim to improve learning and reduce educational inequalities in public schools.

In Brazil, in 2019, there were 1.4 million illiterate children even though they were old enough to be. In 2021, with the COVID-19 pandemic, this number jumped to 2.4 million. Based on this data, the research here the presented approach attempts to reduce this deficit by adopting a pedagogical approach that involves the use of educational games in order to value pedagogy, playfulness and childhood. The intervention activities developed here are focused on what the child needs, which is to play, the ability to imagine, to be with others, to get involved and to laugh. Since games are a form of play (and not the completion of a task), the child's perception of the development of these delayed skills changes, which is why working with educational games is so important.

Educational Games in the School Context

We understand that games have significant potential for work in the school context, as they allow us to plan a more contextualized and meaningful learning process for students, in order to mobilize their interest and make their learning effective. Furthermore, they constitute fundamental activities in the context of cognitive, social, affective and moral development.

Regarding the cognitive aspect, research shows that games with rules can mobilize the subject's cognitive structures and assist in the learning process. According to Visca (2009), games enable the exercise of affective functions and cognitive operations such as classification, serialization, anticipation, conservation and compensation, among others, as well as developing school content. Another aspect that we would like to highlight concerns the importance of these cognitive skills not only at the time of playing, but their relevance for learning the school content referred to as formal and for participating in the various activities proposed in the classroom and by the school, in general.

The issue of anticipating thoughts and planning actions is a skill required at other times in school life, such as reflecting on the writing of words, when producing a text, for example, in which it is necessary to reflect, plan, raise hypotheses and verify them.

The proposal with educational games is based on research carried out and consolidated, both Brazilian (Almeida 2023, Araújo 2022, Morais and Almeida 2022, Lucca et al. 2022, Zacharias et al. 2022, Lucca and Osti 2021, Zacharias and Osti 2021, Carolino and Osti 2020, Fernandes and Osti 2019, Osti et al. 2019, Fernandes and Osti 2016, Kishimoto 2011) and international (Hue and Lee 2024, Lauricella and Edmunds 2022, Visca 2009) which bring results indicating that the game is capable of mobilizing knowledge because it leaves students instigated to experience everything related to games. Specifically, these studies indicate significant improvements in the spelling performance of children who participate in spelling games, improvements in overall performance in writing and reading, and improvements in the development of awareness of grapheme-phoneme relationships. They also state that children can learn in a playful and reflective way as long as they conduct didactic sequences supported by games, whose practice combines playfulness and reflection.

In this way, these works point out how educational games can interfere in the cognitive process and enable learning by mobilizing cognitive structures and developing attention, concentration and anticipation, important skills for learning. Other authors (Araujo 2022, Fernandes and Osti 2015, Cavalcante and Ortega 2008, Dell'agli and Brenelli 2006) understand that the game constitutes an element that motivates the child to be interested in the activity, as it is presented in a different way from a school task, which makes it possible to develop skills and attitudes that can contribute to the learning process in the school context, in the learning of specific school content, such as at the time of literacy, when, for example, working with a game in which words are recognized or the initial or final syllable is identified.

Other authors (Alhassan 2022, Ritzmann 2009, Cavalcante and Ortega 2008, Luna 2008), in addition to pointing out this possibility of the game, explore other possibilities that it offers, such as working with the emotional aspect (experiencing frustration and defeat) and interaction between peers; working with respect for others, since the classroom space also involves emotional, affective and interactive issues between students and between them and the teacher (Iberico et al. 2016, Federico et al. 2019). In addition, it is also necessary for the player to submit to the rules of the game, a fact that can limit their planned actions. Therefore, the subject also teaches self-control.

It is also understood that it is in this process of social interaction, mediated by games, that children have the opportunity to develop certain skills and attitudes that permeate social life and group coexistence. Furthermore, the authors (Fernandes and Osti 2015, Kishimoto 2011, Santos 2011, Visca 2009) emphasize the relevance of games for the learning process, emphasizing that such a resource contributes to the development of attention, logical reasoning, memory, development of argumentation, the ability to position oneself and understand the other's point of view, as well as enabling the work and development of specific content of the school curriculum.

Therefore, as we have seen, there are several dimensions worked on by games as verified by various authors, which justify their inclusion in the educational context as a resource that, in addition to mobilizing the student's interest, also allows for the work with the integral development of the human being, considering not only their intellectual aspect - which is often the dimension valued by the school and in the elaboration of school content. Thus, starting from the principle that games offer contributions to the learning processes in the school environment and their relevance in classrooms and in teachers' planning, we intend to present here the partial results of the research developed and the intervention carried out with one of the games produced.

Literacy Games

According to Leal et al. (2008), games are one of the ways to make literacy teaching more effective and stimulating, as they combine pleasure and fun with learning and make the learning process meaningful, since they integrate pleasure and learning, as well as interaction with others. In relation to the specific literacy process, games can be relevant resources for the systematic teaching of written language, especially those that focus on some aspects of the Alphabetic Writing System, as they help students to consolidate such learning, which is necessary for them to become fully literate.

Games allow students to work on expanding their vocabulary through the different words they work on. They also include contact with the semantic and morphological relationships of words, that is, their meaning in the context used and the structure of these words. Thus, it is assumed that the analysis of word structures is a relevant component for consolidating learning in relation to the properties of the alphabetic writing system. We believe that it is possible to include work with games in the literacy process, aiming at reflections on literacy and advances in the process of

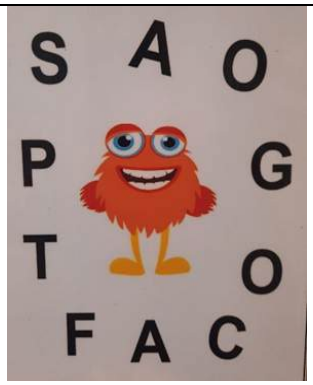
learning to read and write, considering the appropriate choice of games and the proposal of organizing the class into different groups.

Here we will present two of the games produced. The first is more focused on writing, as it is necessary to form a word. The second is focused on reading, as students need to create a sequence of descriptive sentences to discover what the mysterious object/word is. The first game is called "FORMAR" and has the following characteristics:

Aim: Form words in the shortest time possible. The words formed cannot have errors in their formation.
Material: consists of 21 cards with letters separated into three groups: easy, medium and difficult, which are related to the formation of words with simple syllables and more complex syllables.
Players: 2 or more players. The age range of players is 7-8 years old, that is, students in the 2nd and 3rd grades of elementary school. The game can also be used in other grades.
Rules: divided into groups, the teacher chooses a card according to the level of difficulty and gives it to each group, determining the number of words they need to form. Players need to write down the words they form and whoever finishes forming the stipulated number of words first shouts I FORMED IT. The teacher checks to see if the writing is correct. If it is correct, the group wins. The teacher can also set a round limit so that students can play more times, changing the group's chance of winning. At the end of each round, the points are counted. The team with the highest score wins.
Observation: When the teacher realizes that the writing is not correct, the round continues until a group forms the words correctly.
Contents: The game develops reading and writing skills as it involves word formation, spelling and allows the identification of the syllable as a unit of the word; comparing words in terms of sound similarities, developing phonological awareness through the exploration of the sounds of words.
The second game is called SPIKO and has the following features:
Aim: work with reading and interpreting information. To do this, players must, based on reading comprehension, discover the word to which the clues refer.
Material: We have five semantic fields: school supplies, place, animal, food and objects. There are 70 cards and a picture card. The seventy cards contain five clues that help in the description of the word to be identified.
Players: four players or four teams of players.
Rules: It is decided which group starts. Each team can choose which theme they want to play with. Clues are read, numbered from 1 to 5. The player must listen to the first clue. If they do not know what word it refers to, they ask the reader to say the second clue, and so on, until they reach the fifth clue. If the player cannot guess the word, even after reading the five clues, they can consult the picture board. This can only be consulted after reading the five clues and if the player does not know the word.

Contents: The game works on the player's fluent reading and the receiver's ability to interpret information. With the game, it is possible to list other content, using semantic fields, such as a project on healthy eating (FOOD), or a discussion, within the context of geography, of public and private spaces within the city (PLACES). Through the game, the teacher can perceive whether the student has difficulties in reading and interpreting information in other contexts.

Figure 1. *Shows an Image of the Two Games described here*

Game 1 – Form Words	Yoga 2 - Spike
	

Research Context

The funded project began in 2024 and will end in 2026. Here we present the results for the year 2025 in the monitoring of a classroom in the first half of this year. It is worth noting that the research has approval from the Ethics Committee for Research with Human Beings, registered under number 7.332.332.

Participants

21 students enrolled in the 1st year of elementary school participated and were accompanied by their teacher who applied the games and recorded their progress.

Results and Discussion

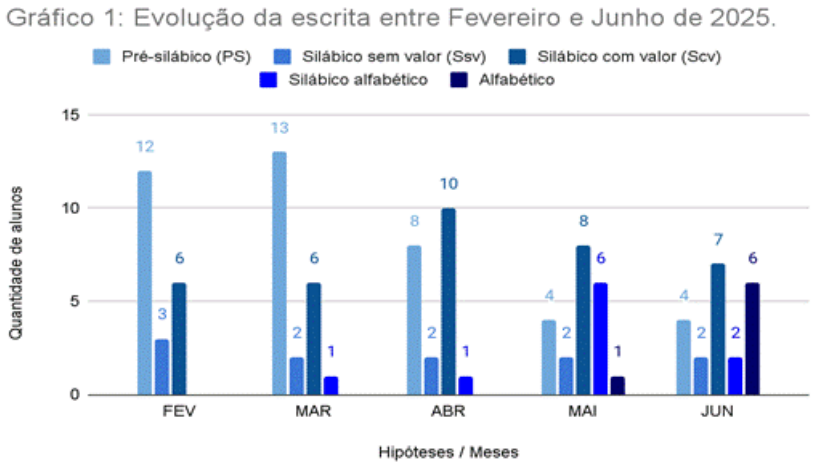
The interventions began in February and ended in June 2025. Monthly assessments and weekly interventions were carried out with the games developed. The students were assessed on their writing and reading skills.

The students were organized according to the principle of heterogeneity of knowledge, that is, they were grouped based on their varied knowledge about reading and writing, which could be beginners or advanced (in this case, students

who have already consolidated some learning about the writing system help their peers by expressing their ideas and reflections, helping others to also advance their hypotheses about writing). As mentioned, the groups were composed of a mixed group, that is, the members had different ways of understanding the construction of writing. It can be seen that the students, in general, made progress in terms of constructing hypotheses about writing. Here we present the records described by the literacy teacher.

Graphs 1 and 2 show the results of this first semester of monitoring and development of games in relation to the assessment of reading and writing.

Graph 1. *Evolution of Writing between February and June 2025*



Prepared by the author. Source: Researcher's data.

The writing results show that in the first assessment, we had 12 students who still could not differentiate letters from other symbols, 03 who wrote using only vowels and 06 who wrote with the sound correspondence, using vowels and consonants. Throughout the intervention process, it was observed that there was a change in learning. In the last assessment, we had 04 students who still maintained the writing hypothesis of the first assessment, that is, they still could not differentiate between letters, numbers and other symbols. The greatest improvement occurred in 06 students who are literate compared to the three assessments carried out in February, March and April, in which there were no students in this phase and in the other phases, as there was improvement in all of them.

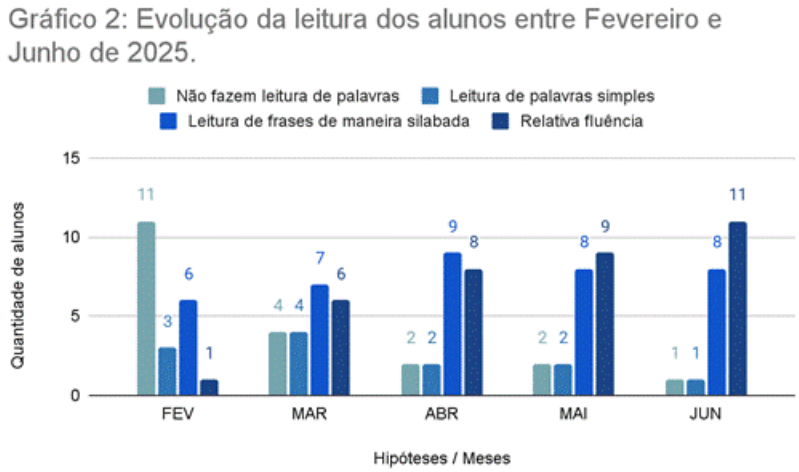
In the work on phonological awareness, the study of rhymes began, at this first stage, with the aim of identifying words that rhyme, especially in oral language. Work with full names is another aspect that has shown progress, with some children now able to write without the support of their name tags. Although the class has already demonstrated the consolidation of the identification and recording of letters outside of alphabetical order, this continues to be a subject that is worked on in the assessments.

The student teams were formed into groups with children at different levels of literacy. The justification is that organizing the teams in a heterogeneous manner

helped the activity to occur cooperatively among the group participants. The game made it possible to work on writing; think about letters and words, as well as the sound aspect; team collaboration; discussion of ideas; and dealing with competitiveness. The students were able to understand that words are formed by sound segments and that these segments can appear in different words; in the game, students have the opportunity to establish this relationship in the initial, medial, and final syllables of words that contain the same sound segment. This understanding is important for the student to learn how the alphabetic writing system works when writing. Since the grouping was heterogeneous, the children who are still at more elementary levels of constructing the writing hypothesis are assisted by their peers. We also recognize the importance of the intervention of the teacher who mediates the entire activity.

It is considered that the collective game moment can be very productive, since students can interact and debate in relation to the correct separation of words into syllables, as well as the correct pronunciation of some words, since some have more letters, and students may have difficulty saying them.

Graph 2. *The Evolution of Students' Reading between February and June 2025*



Prepared by the author. Source: Researcher's data.

In the first assessment, we noticed that 11 students did not read words, 03 read simple words, 06 read syllables and only 01 was relatively fluent in reading. During the intervention period, it was possible to observe that there was a change and that the students evolved from one phase to another. In the last assessment, we have 11 students with relative fluency in reading, 08 who still read syllables and only 01 who still do not read and 01 who only read simple words, which demonstrates the group's evolution.

Regarding the reading process, constant progress is noted, and during this period it is observed that there are more students seeking to read by decoding syllables/graphemes, although the use of strategies such as basing themselves on stable words remains. There is also progress in reading sentences or longer periods. Regarding the work with phonological awareness, in addition to the previously mentioned skills, the proposal for identifying rhymes in speech and writing was

initiated, although at this first moment we sought to perceive the ability to recognize rhymes in the context of speech. According to the specificity of the class, a professor worked on it a game that articulates syllable-image, to help students who present difficulties in the learning process.

By analyzing the results of the assessments carried out during the months in which the activities involving games took place, it can be stated that there was a significant change in the development of students' learning in terms of writing and reading. It was found that the games contributed to the students' learning process, because, throughout the semester, all students progressed in their writing skills, especially during the period of activities involving games. It is also important to highlight that it is understood that games alone are not capable of guaranteeing success in learning to read and write, since such learning requires the involvement of other skills and resources. However, what is presented in this text is the contribution of games to the learning of important content that is necessary for the acquisition of reading and writing in a systematic and planned way and that contributes to making the literacy process playful.

It is worth noting that according to Leal et al. (2008), games are one of the ways to make literacy teaching more effective and stimulating, as they combine pleasure and fun with learning and make the learning process meaningful, since it integrates pleasure and learning, as well as interaction with others. In relation to the specific literacy process, games can be relevant resources for the systematic teaching of written language, especially those that focus on some aspects of the Alphabetic Writing System, as they help students to consolidate such learning, which is necessary for them to become fully literate.

Final Considerations

The main objective of this text was to discuss and demonstrate how games can be an important resource that contributes to the learning process, especially during the literacy period. Specifically, we sought to include playfulness as a component of the learning process, to use educational games to construct the acquisition of the alphabetic writing system and to develop activities that improve student learning. Therefore, it can be inferred that in this context, games, more than just entertainment, emerge as a teaching tool, a differentiated strategy used with students in the classroom.

We believe that games are a human, cultural and social construction, and are present in children's daily lives. For this reason, we understand that games are important resources in the learning process due to the relationship they establish with the learner. That is, in the game the subject becomes active in the face of the learning content. As in the case of learning to read and write, in a game, the student will have a relationship with language in a dynamic, active, questioning way, and with the possibility of error being an opportunity for learning, unlike other teaching strategies, in which the subjects are passive and relate to language as something distant and, often, for students who have difficulties, as something incomprehensible.

The results of the research carried out show that the group of students advanced in their writing hypotheses, comparing the beginning of the year (February) and the end of the activities with games (June), as well as the progress observed in the period of activities with games (between May and June). As already highlighted, games alone do not guarantee learning, however, one cannot fail to infer that this significant progress of the class, in this period, also represents the contribution of games to the reflection of writing and advances in learning.

In this sense, it can also be stated that specific literacy games allow students to work with the sound properties of words, highlighting the relationship between sound and spelling, which is necessary when reflecting on the writing of words. Furthermore, we can highlight the contribution of these games to the development of phonological awareness, helping students to understand that words are formed by different sounds or groups of sounds and that these can be segmented into smaller units. In this case, games that work with rhymes and alliteration stand out, in which these properties of phonological awareness contribute to the manipulation of these specificities in a dynamic way.

Based on the results, we reiterate the relevance of games in the school context and especially for the literacy process, since this resource allows for a certain degree of flexibility for the teacher, organizing the class in different ways, while still considering the students' learning needs. In addition, we believe that these groups can also contribute to the exchange of knowledge among peers, helping students to evolve in the development of their hypotheses about writing.

Thus, it is hoped that the discussions held here will help teachers both in understanding the contributions of games in various aspects worked on in the school context, specifically in the literacy process, as well as having practical examples of possible ways of inserting it in the classroom, aiming at the full development of students.

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