The school on the move for the promotion of reading competence: a theoretical review*

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Abstract

The current article addresses the promotion of reading at school. There is previous evidence and several theoretical arguments in favor of the integration of physical movement in the teaching-learning process. The question is raised as to whether this integration is plausible, specifically for learning to read, and how it could occur. Through a literature review, considering predominantly German studies, the objective is to identify the arguments related to the process of reading and literacy. The arguments are discussed in the light of the Text Processing Model by Walter Kintsch and Teun van Dijk and Heinz Heckhausen's Rubicon theory. Arguments are presented regarding cognitive reading processes, volition, and motivation, which support the assumption that the acquisition of reading competence gains important stimuli through the offer of classes on the move. It seems plausible that the insertion of movement acts on the goals that the reader wants to achieve through reading. Body self-esteem seems to have a positive impact on volition through reading and an influence on the reader's self-concept. Some teaching and learning activities are put forward for physically active reading classes in terms of literacy, found in the specific literature. Differentiation is made between teaching and learning activities on the move, which accompany and facilitate learning.

Keywords

Learning – Reading competence – Teaching – Physically active classes – Movement.

* English version by Robin Camargo. The authors take full responsibility for the translation of the text, including titles of books/articles and the quotations originally published in Portuguese.

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Introduction

The concept of the "school on the move", also called the "mobile school", has been disseminated since the 1990s (HILDEBRANDT-STRAMANN, 2005). With the socialization of its conception, the number of studies on the impact of integration of movement in the teaching-learning process has expanded in developed countries, as well as the search for successful pedagogical means to implement physically active classes (BEDARD *et al.*, 2019; CASSAR *et al.*, 2019; NORRIS *et al.*, 2019; SNECKL *et al.*, 2019; VETTER *et al.*, 2020). However, in Brazil and other developing countries, the scientific dissemination of this concept is still incipient.

It is recommended that more movement be inserted in the teaching-learning process and several demands for school education have been formulated. These demands and recommendations are based on arguments from different areas of knowledge, such as ergonomic, physiological, and pedagogy in the area of health and education for safety reasons. Appeals have been for school equipment appropriate to the needs of students' bodies (LAGING, 2017; ANRICH, 2002; REGENSBURGER PROJEKTGRUPPE, 2001; KÖβLER, 1999). There is talk to support teaching in favor of body awareness and in response to the bodily needs of children and young people (FISCHER, 2000); teaching behavior appropriate to human physiology to prevent body degeneration (ANRICH, 2002). The wider promotion of motor skills is necessary to avoid everyday accidents caused by tripping or stubbing feet through a school on the move (KÖβLER, 1999), as well as for the adoption of active habits throughout life (STODDEN *et al.*, 2008).

There are also reasons in favor of inserting more movement into the school with reference to changes in the children's world and from the perspective of school ecology, educational theories, and anthropology of education. In the modern world, the child's autonomy for free and exploratory movement is reduced and, therefore, the school should, as much as possible, compensate for this deficiency (MÜLLER; PETZOLD, 2014). Cultural activities (for example, traditional games) are also expressed in movement or through movement, which should be transmitted to students (LAGING, 2017). Furthermore, movement is part of human life and a school that is considered a space for the child's life cannot neglect the role of movement in its pedagogical proposal (REGENSBURGER PROJEKTGRUPPE, 2001). Considering the anthropological approach, it is claimed that through feeling, by grasping and holding, specific areas of the brain are activated, stimulating learning. Since this feeling implies a movement, it is understood as a component of human learning (BECKMANN, 2013).

Developmental psychology also recognizes that movement contributes to the subject's personal, social, productive, expressive, impressive, exploratory, comparative, and adaptive function (LAGING, 2017; REGENSBURGER PROJEKTGRUPPE, 2001). Other compelling arguments are found in the area of knowledge of psychology, specifically from the psychology of learning. We refer to these in the course of this publication.

To build a School on the Move, different building blocks can be used for different school dimensions. The insertion of the movement depends, for example, on the school spaces themselves and the school organization. The architecture of the school building

can be designed in a stimulating way for movement, allocating specific spaces for it. A school on the move can be carried out in extra-school activities, at times outside regular school hours or during breaks. It can also be expressed as part of the conception of the teaching-learning process in physical education with movement, in pedagogical projects with movement, and in the teaching-learning process itself in the classroom (LAGING, 2007).

The object of the current work is the learning of articulated reading with physical movement in the classroom. We seek, in scientific publications and specific literature, for reasons that make it plausible to promote reading skills through physically active teaching and learning activities and possible forms of application. We based this on a review of the scientific literature and, to this end, we chose predominantly German-language scientific collections. We aim to bring less accessible sources to the Brazilian scientific community with the expectation of diversifying and/or supporting arguments already consolidated in the Brazilian discussion regarding the promotion of reading.

We were guided by the following orienting questions: (A) Can the integration of movement into the teaching-learning process also be expected to provide a gain in the acquisition of reading competence? (B) Is sensitization of sensory perception by direct interaction with the environment through movement important for the complex process of reading and writing? (C) Can movement, as well as in the teaching of reading, be applied in order to facilitate learning? and (D) what are the reading activities that include the integration of sensory perceptions?

We suspect an affirmative answer to these questions, since regarding the specific relationship between movement and language, functional and organic disorders of the brain have already been identified through the fact that clumsy movements and learning and reading difficulties often occur at the same time (BREITENBACH; BRAND, 1987 *apud* MÜLLER; PETZOLD, 2014). These disorders inhibit "[...] the ordering and coordination of incoming information, as well as the comparison with existing data and appropriate adaptive reactions."[2] (MÜLLER; PETZOLD, 2014, p. 19). Especially, important significance is attached here to complex movements (KAHL, 1992 *apud* MÜLLER; PETZOLD, 2014).

We consider it opportune to present, initially, the understanding of reading applied in this article. Therefore, we answer the orienting questions in more detail in the light of the text processing model of Walter Kintsch and Teun Van Dijk (1978) and Heinz Heckhausen's Rubicon Theory (1989). Using these approaches as a background, we theoretically discuss the possible positive influence of physically active classes on learning to read.

The plausibility of Teaching and Learning on the Move to promote reading competence in the light of the text processing model of Kintsch and Van Dijk

In order to address the questions under consideration, one cannot lose sight of the complexity of the reading process. To illustrate this complexity, we present here the main ideas of the text processing model by Kintsch and Van Dijk (1978), a model to which

2- The quotations were freely translated by us into Portuguese; and afterwards into English.

other studies of neurolinguistics have also referred, such as, for example, the work of Scherer, Jerônimo and Ansaldo (2011) and Jerônimo and Hübner (2014). The model shows how a person is guided during reading, both by the text (*top-down*), as well as by the characteristics of the reader (*bottom-up*).

Kintsch and Van Dijk (1978) understand reading as the synergy of several partial processes, which can occur both sequentially and simultaneously. The authors start from the assumption that the reader interprets a text as a set of propositions (KINTSCH; VAN DIJK, 1978; VAN DIJK; KINTSCH, 1983; GRAESSER, MILLIS; ZWAAN, 1997). During the reading of a text, the reader extracts these propositions that are minimal fragments capable of expressing a textual meaning (VAN DIJK; KINTSCH, 1983) and intuitively tries to recognize coherence between them, that is, to articulate them in such a way to make some sense. The reader constructs the meaning of the text, uniting the propositions, first at the local level (local coherence) and later as a whole (global coherence).

Local (microstructural) coherence is the relationship of a single proposition with other similar propositions, that is, of neighboring sentence propositions. As Mokhlesgerami (2004) points out, these are propositions at the lower linguistic (word and phrase) and semantic (lower units with a textual meaning) levels.

During reading, the reader receives *inputs* into their sensory memory, extracting from them propositions that are stored in the workings memory (*working register*). The reader uses what was gathered from previous propositions, and which overlaps with a new proposition gathered while reading the last part of the text, to build local coherence. The propositions thus articulated create networks, which, however, can still, as loose elements, coexist side by side.

Since a text is composed not only of explicit information, but also of implicit information, the reader tries to close gaps if there is no direct relationship between the (networks of) propositions. In other words, if the reader fails to recognize an explicit relationship between what they read previously and what they are reading now, they build them, making local inferences, which are articulations of codified propositions, also called content arguments. The creation of inferences is understood as a way of supplementing knowledge. With this new and complementary knowledge, a model of the situation of what was read is generated at the same time. This model is also called a mental model or a situational model[3] (VAN DIJK; KINTSCH, 1983; GRAESSER, MILLIS, ZWAAN, 1997).

In their model, Kintsch and Van Dijk (1978), however, start from a reader who already performs the decoding processes in an automated way, although they recognize that the model also has implications for readers who have mastered word and phrase recognition, without, however, integrating them into a total image. The authors suspect that the operationalization of decoding itself does not consume more resources, but that certain limited capacities, on the part of the reader, will have a negative impact on the time of archiving information in memory and in the production of responses.

3- The mental model was introduced by Kintsch and Van Dijk, because the mechanical character of the model was previously criticized: the model could not account for the differences between readers; it was linear and therefore could not adequately consider the multiple possibilities of articulations between previous and new propositions; and the model ignored that the reader would have already built a mental idea, at the beginning of the text processing (MOKHLESGERAMI, 2004).

Although participants did not show significant differences in a conventional memory test, Perfetti and Goldman demonstrated (1976 *apud* KINTSCH; VAN DIJK, 1978) that readers who have difficulties in reading memorize less of the text in short-term memory than readers without difficulty. These memorization capacities are, however, decisive because, in the search for coherence and the construction of inferences, the reader needs to have access to the summary of explicit propositions as well as some local inferences, which is called the textual basis.

Kintsch and Van Dijk (1978), therefore suspect that part of the working memory is short-term cache memory (*short-term memory buffer*) with only a limited storage volume, in such a way that only a certain amount of the propositions already worked on must be chosen and stored. Thus, only this limited quantity becomes accessible for articulation with the new propositions, gathered during reading, that is, the cyclical process, in which one searches among the propositions already stored for possible overlaps with a new argument; this is an automated process that consumes only a few resources. However, if an obvious and clear overlap is not found, a search for coherence and the creation of inferences begins, and these processes do consume resources. The reader articulates, in a costly process, the contents worked and stored in the working memory with relevant knowledge from their long-term memory.

Considering that, for ergonomic reasons, the sitting posture in a right position regains little body energy and that this leads to fatigue and impairs concentration (MÜLLER; PETZOLD, 2014), it seems plausible that the insertion of movement could be beneficial, especially for students with reading difficulties. Both the proposal to insert more alternations in the student's body behavior (postural transitions), and the proposal to integrate the activity with movement to increase storage capacities seem plausible to us, since it is multimodal experiences, such as tactile-kinesthetic experiences, that promote the storage of content in memory (BECKMANN, 2013; LAGING, 2017).

The integration of the extracted propositions is essential, because the construction of a local coherence on the surface of a text is not enough to understand a text as a whole. Propositions and articulations that exist loosely, side by side, can also present inconsistencies and contradictions. Therefore, global (macro-structural) coherence is required, that is, organization and hierarchy of propositions at the micro level and an integration of (still) loose networks.

To achieve deeper understanding of a textual content, the reader also seeks articulations of the propositions in the macro structure, which are either recognized explicitly on the surface of the text or recognized only when using prior knowledge. In the case of gaps or divergences, the reader again builds inferences, using information implicit in the text or knowledge external to the text. Here the expectations that the reader has also matter and these are influenced by reading motivation.

Assuming that the reader's expectations and reading motivation can also be external and extrinsic, the combination of reading with activities on the move, including involving interaction with other students, seems to be advantageous precisely for those students who gain little motivation to read from the text itself. In this case, motivation can come from participating in an interactive activity and executing a movement.

At the global level, the reader can, while reading, make use of certain macro rules[4]. Controlling the use of these macro rules is again the goal that the reader wants to achieve through reading. In addition, the purpose of reading, such as finding a solution to a problem, influences understanding (KINTSCH; VAN DIJK, 1978). In this way, the reader uses the textual information not only according to their existing mental information, but also according to self-interest and the stated objectives. When generating a mental model of what has been read, the reader draws on their life experiences, previous knowledge, and contextual knowledge, as well as their specific textual knowledge about the communicative function and the sex characteristics of the text to close the existing gaps through conclusions (construction of inferences).

The plausibility of Teaching and Learning on the Move to promote reading competence in the light of Heckhausen's Rubicon theory

The reader is also driven by their self-concept as a reader. Self-concept is composed of variables such as estimation of your own talent and self-efficacy, the prediction of efforts, and the necessary resilience to be applied for a successful action, as well as the expectation of *feedback* from third parties. These factors influence the treatment of information and the individual's behavior (HECKHAUSEN, 1989; RHEINBERG; VOLLMEYER, 2012). We suspect that the perception of reading success can be positively influenced when there is positive feedback about the activity being well executed, just as we assume that the interactive nature of teaching activities on the move provides greater opportunities for immediate feedback from peers in the classroom (*peer group*), in addition to that from the teacher.

Developmental psychology argues that the student's self-concept is also influenced by body self-esteem (GERBER; PÜHSE, 2005 *apud* MÜLLER; PETZOLD, 2014). Positive motor experiences can, as pointed out, lead to performance motivation (GRUPE, 1982 and SCHENDEL, 1998 *apud* MÜLLER; PETZOLD, 2014). Thus, we assume that the reader's negative self-concept can also be improved through positive body self-esteem. We also assume that the pressure of school performance can be reduced through a combination of reference standards (intra-individual, inter-individual, social, and objective) regarding their reading competence, combined with reference standards regarding their motor skills. It is possible the mastery of the body and the feeling of security in the execution of movement can reduce the fear of presenting weaknesses in reading.

Therefore, we consider it plausible that physically active classes that seek to increase the opportunity for sensory experiences and awareness of the body itself can become positively influencing factors in the acquisition and development of reading competence.

4- One rule states that you cannot eliminate a proposition when it is a condition for interpreting the next proposition. Deletion is only allowed when the proposition is irrelevant to the direct or indirect understanding of the next proposition. Another rule allows the substitution of a proposition that describes subsets with a more general proposition if this describes its quantity of the total (*generalization*). A sequence of propositions can also be replaced by one proposition, when this new one describes that sequence by means of a global fact (*construction*) (KINTSCH; VAN DIJK, 1978).

> One could speak, then, of an *optimization of the treatment of information,* if the teaching object (rules, vocabulary, orthographic particulars, or similar things) is being worked or fixed together with a walk around the room, with an exchange of places, with *moves of softball* etc. (MÜLLER; PETZOLD, 2014, p. 19; emphasis of the authors).

In addition, interaction, communicative initiative, and self-representation of one's interpretation of a text - all made possible through physically active classes - can positively influence motivation through social coexistence. This makes us assume that a physically active reading class that does not take place under pressure of reading performance, but that is oriented towards the pleasure of the action itself, leads to an increase in the individual's volition for reading.

Motivation and volition are, together with self-perception and self-control, fundamental elements of self-regulation of learning.

> Self-regulated learning is a form of learning in which the individual, in function of the nature of their motivation, in a self-determined manner, takes one or more self-management measures (cognitive, metacognitive, volitional or behavioral) and self-controls the progress of the learning process. (SCHIEFELE; PEKTRUN, 1996, p. 258 *apud* SCHMITZ; SCHMIDT, 2007, p. 10).

According to Heckhausen (1989), motivation can be understood as pre-intention and volition as post-intention. The author's Rubicon Theory addresses (1989), in addition to the causal attribution, the two phenomena on which we focus here. In the first phase, the pre-decision phase, the individual ponders the feasibility of several alternative desires. Depending on the degree of motivation in a specific situation or at a specific moment, the individual makes their choice, considering the potential objective of action. We are also talking here about the composition or formation of intention. Motivation then describes the processes and effects for which the individual has chosen a particular action. The individual ponders the existing alternatives for action with regard to possible consequences, reconciling their own expectations about the outcome of the action. On the basis of these reflections, the individual invites himself to act or not to act. A motivation trend is created. In case of conflict between motivation trends, the one that is the strongest becomes effective.

While in the first phase of the pre-decision the individual asked himself what he wants, now, in the second phase, in the phase of the pre-action, he asks himself how he wants to accomplish this. Here we talk about the intention to implement and initiate the objective. To this end, an internal approval needs to be built. This is about volition; it then covers reflections on the operationalization of the intention. The transition from desire to intention depends on the expected feasibility of the intention. It is volition that turns intention into an initiation of action and it is oriented towards the operationalization.

It may be that the individual has several intentions that they want to initiate an action, simultaneously, but only one can, in fact, initiate it. This is why, in the first place, it is necessary to suppress these other intentions, especially those that may perhaps be even stronger in competition with the chosen intention. Here the degree of volition

matters and reveals how much the person is committed to their goal (*commitment*). The person plans and decides how to operationalize the action, that is, when, how, and under what conditions the realization can occur. Again, there is, among others, a comparison and reconciliation with one's own expectations. One cannot underestimate, according to the ecological motivational approach of the activity, the joy and pleasure that one expects to experience in the operationalization of the action.

In order not to question the decided intention, as explained by Heckhausen (1989), the person searches for information that reports in favor of the intention and avoids any that may raise doubts about it; the greater the degree of volition, the more likely (and faster) the initiation of the operationalization of the action. An insufficient volition, however, can express a lack of determination or weak determination even before the initiation of action, for example, when action obstacles appear or are expected or can be expressed through low persistence during operationalization (HECKHAUSEN, 1989). Motivation will, in fact, lead to action only if it becomes a resulting trend towards the creation of intention and, ultimately, the initiation of action.

Therefore, we suppose that, especially, students with reading difficulties, who feel under pressure and obligation to read (specifically to read aloud), may show more motivation and volition for reading when it is combined with body movement. Understanding movement as an activation optimizer, which can compensate between a low activation level (tiredness) and a high activation level (anxiety and/or stress) (REGENSBURGER PROJEKTGRUPPE, 2001), we imagine that the physically active reading class may be perceived by the student as a rewarding activity.

However, it is necessary, as the Regensburger Projektgruppe (2001) warns, to be careful not to feed a vicious circle. For students who have difficulties in reading and who do not like to move could feel even more pressure or could feel excluded. Therefore, specific activities on the move and read*ing exercises for students should be formulated*.

In light of this, Kruse (2007 apud VOSS, 2015) helps us to distinguish three concepts for reading promotion: reading training (building basic reading skills), reading promotion (building a motivational basis for reading), and literary reading (building a literary formation for the analysis of literature).

Reading training indicates, among other things, elementary competence (training in looking, signs, syllables, words, and articulation of parts of sentences) and text comprehension. We recognize here the levels of cognitive (meta) coherence building at the local and global levels, as illustrated in Kintsch and Van Dijk's text processing model. Elementary competence refers to hierarchically lower levels of reading and text comprehension to hierarchically higher levels, that is, comprehensible reading competence.

The construction of a motivational basis for reading is sought through the provision of happy and pleasant situations and in literary training through the initiation of reading experiences and familiarization with books and literature. It wants to "[...] turn children into readers." (GUNDT, 2007, p. 212), give them pleasure in reading. The predominantly traditional cognitive-analytical teaching of reading, as Gundt (2007) points out, has not necessarily been a pleasure and a motivation.

The positive impact of the integration of activities with movement in teaching to promote reading via the three concepts seems plausible to us, because the reception of information also occurs by kinesthetic proprioceptors distributed throughout the body. Sensations and perceptions caused by movements can provide relevant complementary information to support learning.

Physically active classes to promote reading

Results of research and scientific knowledge are sometimes not incorporated into the practice of the teacher because it remains to be considered how to operationalize the results, that is, how to "translate" them into praxis. Therefore, we present some examples of Learning on the Move in teaching reading.

First, we consider it opportune to distinguish between activities in which the movement assumes the function of accompanying learning and activities in which it assumes the function of facilitating learning. When the movement in the teaching of reading accompanies the learning, we call this here "teaching on the move" and, when it assumes the function of facilitating learning, the activities are called "learning on the move".

A teaching on the move for reading, for example, tries to take the student out of their sedentary posture during the class. The student may be asked to rise from their place in the classroom to assume a specific reading position out loud, for example in a reading circle. Worksheets, instead of being distributed to the class, can be placed on the teacher's desk so that the student needs to get up and pick them up. Learning stations with different tasks can be set up, distributed throughout the classroom, at which students perform individual or group work (FISCHER, 2000). It is not necessary to read in the classroom in a sitting posture, students can also read while lying down or standing up. Even so, specifically during reading, the sitting position is the most adopted body behavior, although practical instructions show that reading is also possible in a lying down position (with the light support of, for example, a roll or towel on the knees and ankles or on the back with leg inclined 90º above a support, for example, above a chair) (FISCHER, 2000; MÜLLER, 2010).

It should be remembered that students with reading difficulties memorize less of the text in short-term memory and, therefore, more resources are consumed to try to build inferences and fill in the gaps between the propositions (KINTSCH; VAN DIJK, 1978) and that the sitting position, especially on inappropriate school furniture, for ergonomic reasons, can lead to fatigue (MÜLLER; PETZOLD, 2014). We describe here some examples of activities with movement in order to accompany learning. There is the Puzzle activity, in which stories are cut into parts, each part assigned a number (or a letter), and the parts spread on the walls of the classroom. Students read the parts and try to identify the correct sequence and record the order of numbers (or letters) in their notebook. Cards can also be distributed with pairs of rhyme verses, or pairs of opposites or familiar words which children are required to correctly match by walking around the room to look for the pairs (BECKMANN, 2013).

Contrary to the traditional dictation, in which the teacher reads aloud a text that the students write down, sitting at their tables and in silence, in their notebooks, the running dictation works as follows: the excerpts of the text are spread throughout the classroom, for example, on a rope or a clothesline on the walls. The student goes to the extract, memorizes it and then returns to their desk to write down, in their notebook, what they memorized (REGENSBURGER PROJEKTGRUPPE, 2001; FISCHER, 2000).

Similar to the running dictation is the orthographic task called "Scan", in which, a student leads a classmate, who keeps their eyes closed, in the room towards cards hanging on the wall that each contain a word. When they arrive at a card, the student opens their eyes, "scans" the word and is then, with eyes closed again, directed back to their place where they open their eyes and "print" (writes down) the word "scanned". Being directed with eyes closed increases the effect of focusing on the word at the time of visual impression (BECKMANN, 2013).

The division between activities that accompany learning and those that facilitate learning does not have to be rigid, as the previous examples demonstrate. We, however, restrict the concept of activities that facilitate learning to those that directly articulate the teaching content with the proposed movement. For example, the student can be asked to read a word or phrase while standing on an unstable surface (e.g., gyroscope). Here, two challenges must be dealt with at the same time: the motor process of balance stability and cognitive reading processes. Exercises like these are also presented in the Life Kinetik® method of Horst Lutz (2014) and their plausibility analyzed by Tejada *et al*. (2017).

There are several activities through which movement can be used as an information channel. Voss (2015) points out that children process language like music. Before managing semantic meanings, they recognize the melody of the language, the rhythm, the accents, the tempo, the pauses, and the timbre. Phonological awareness can be perceived and expressed by jumping on a small trampoline, just as you can feel the separation of the word into syllables by touching your fingers or clapping your hands. During reading, the student can stretch their arms when long vowels appear and put their hands on the waist when short vowels appear. They can also write words on the floor (for example, using foam).

Previously agreed movements can be used to communicate identification of generic terms, local prepositions, or to memorize words or texts (GASSE; DOBELSTEIN, 2003 *apud* GUNDT, 2007; MÜLLER; PETZOLD, 2014). Students can perceive the letters in a body shape, through kinesthetic proprioception. They can perceive them by touch, feel them, jump them, or form them with their own body. Students can also jump letters and words, on an ABC painted on the floor, or can, lying on the floor, draw them with their legs. They can draw them on the back of a colleague or draw in the air, with the hand of a colleague who keeps their eyes closed (MÜLLER, 2010; LAGING, 2017). As pointed out by Bechmann, writing itself, using the hand, is an experience of space by the body (2013).

To practice recognition of sounds or the identification of letters, there is, for example, the following exercise: first a certain movement is defined for each sound/letter, then cards are distributed, each with a photo of a different object, among the students. The students are required to recognize whether the object on their sheet contains that sound/

letter, which the teacher communicates aloud to the class. In case the name of the object contains the sound/letter, the student needs to perform the agreed movement.

Movement can also be used express decisions about grammar and spelling (MÜLLER, 2010). If a noun is written with a capital letter at the beginning or because it represents a proper name, it can be expressed by a previously agreed movement, for example, stretching. Understanding location adverbs can be supported by exercises such as: the teacher reads phrases while a student positions themself, in a pair exercise, in front, behind, or beside their colleague, respectively, according to the location adverb heard (BECKMANN, 2013). The placement of grammatical signs can be expressed bodily: the question mark by means of a flexed position, the point by bending down, and the exclamation mark by standing on tip-toe. The temporal forms of verbs can be symbolized by a backward or forward movement. Movements can be agreed for correct or false decisions regarding spelling or the application of articles and prepositions (MÜLLER, 2010; VOSS, 2015).

These are examples of activities where movement facilitates learning because the movement is directly linked to the acquisition of linguistic knowledge and the examples are of exercises that refer to the reading processes of lower hierarchical levels (identification of signs, parts of words, words or syntactic articulation of parts of phrases, or articulations of phrases).

If the playful representation goes beyond the level of words and phrases, reading processes are trained at higher hierarchical levels. For example, students may be asked to express their feelings while reading through mimics. With a skipping rope, you can activate prior knowledge of a text or explore vocabulary (VOSS, 2015; MÜLLER, 2010). It is possible to motivate students to experiment and memorize poems through acting movements, to enact stories, songs or literary texts (ANRICH, 2002; FISCHER, 2000; MÜLLER, 2010). For this, finger/hand puppets, masks, and shadow play can be produced and used (MÜLLER, 2010).

The staging of a text or dramatizations can help to build internal images (GUNDT, 2007), or, as Kintsch and Van Dijk call it, a model of the situation of what has been read. In comprehensive reading, the situational model, built by the reader, is important, but "[...] many children have problems especially in this part. They have predominantly consumed ready-made images and, therefore, do not have or have only insufficiently developed their imagination skills." (GUNDT, 2007, p. 214).

Müller and Kschmaer (2016) present around 100 ideas for the school subject of teaching German. These are distributed into activities to promote speaking and listening (19 activities with movement), writing (23), reading and understanding (17), and thematic of language (42). The examples presented above referred predominantly to training basic reading skills, so we chose to list, below, some activities described by Müller and Kschamer (2016) that refer to reading comprehension and literary reading. Among the various activities, we selected those in which the movement assumes the function of facilitating learning and which we associate with the hierarchically superior processes of reading.

Table 1- Examples of teaching and learning activities that facilitate the learning of reading processes at hierarchically superior levels

Didactic-methodological activity	Description of activity
Ad libitum game	Representation of fables, legends, parables with mimicry, gestures, body language, and movement.
Set of dolls with sticks	Construction of dolls with sticks, which represent the protagonists of a text.
Shadow game	Representation of scenes without verbalization.
Pantomime	Pantomimic representation of the relations of figures in the text.
Constellation of figures	Distribution of literary figures linked by strings/rubber bands to reflect the network of relationships.
Memorize poems while moving	Memorize the poem while walking and recite a poem with body presentation according to the content of the poem.
Poem-Circle	Each verse of a poem is written on a separate sheet. The cards are distributed among the students. Each student walks around the room and memorizes their verse. Then students need to put themselves in the right order and say the poem aloud. Later, the cards/verses are exchanged.
Student Theater	Representation of text scenes.
Static image	The student takes on a posture of a static image, which reflects a situation in the text. The static image can also be developed during the reading of the text.
Scene direction	A student (s) reads a text, which includes a scene direction and students follow instructions.
Short story memory	Parts of different short stories are distributed. Students receive blank cards and walk around the room, reading parts of the texts and writing down the possible name of the story on their card and place the card next to the passage.

Source: Own elaboration, according to the activities presented by Müller and Kschamer (2016). Free translation by the authors.

Final considerations

Learning cannot be reduced to cognitive processes. This is also true when it comes to learning to read. Reading models, such as the Kintsch and Van Dijk's (1978) text processing model and theories of self-regulated learning, illustrate this. The human being as a whole is involved in the teaching-learning process. The body, its sensations and its perceptions contribute to learning, just as the psyche, motivation and volition and self-concept influence learning, as represented by Heckhausen's theory (1989).

The arguments in favor of integrating physical movement in the teaching-learning process presented herein remind us of the value of non-verbal bodily experiences, as Liechti warns (2000 *apud* BECKMANN, 2013) and enable, especially in a verbalized existence, Learning on the Move to seem plausible.

Fundamental statements such as those that all activities that involve movement "[...] [promote] cooperation of the senses and cause complex reactions of adaptation, which help in the response to sensory stimuli." (REGENSBURGER PROJEKTGRUPPE, 2001, p. 87-88), suggest a positive answer to the four guiding questions posed in the introduction, which reflect our opinion.

Thus, (A) the reasons presented in our analysis make us expect a gain in the acquisition of reading competence through physically active classes. (B) Regarding sensitization of sensory perception, a gain is expected due to the simultaneous activation of different senses, including movement, because it is expected, in this way, to increase memory capacity, the ability to concentrate, and the motivation to learn. (C) Regarding the function of movement to facilitate learning, the complexity of the reading process implies memory skills and motivation, which are indispensable factors in the reading process, as shown in the light of the Kintsch and Van Dijk (1978) text processing model and Heckhausen's Rubicon Theory (1989). In this way, physically active classes can, as the literature indicates, contribute to memory, motivation, and volition. (D) Finally, regarding reading activities that include the integration of sensory perceptions, the difference was shown between those teaching activities that increase physical movement in the classroom, however, without necessarily being articulated with the teaching content, and those activities that propose movements linked with the objective of teaching and learning. With respect to the latter, we again distinguish between activities that correspond to hierarchically inferior processes and that correspond to hierarchically superior processes of reading, according to the model of Kintsch and Van Dijk (1978).

We stress the importance of recognizing that learning in a disciplined way is not only expressed in silent behavior and a sitting posture by the student, but, at the same time, we emphasize that there is no need to make teaching reading into physical education teaching. There are several teaching and learning activities that involve light and moderate intensity movements to promote reading competence.

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