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## **Perspective of visual perception in learning to read and write in children from 6 to 8 years old.**

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**Abstract**--The present study addresses the perspectives of visual perception for learning reading and writing in children from 6 to 8 years old, the objective of the research is to explain the concepts of visual perception, the problems that may arise in reading and writing if it is not developed properly, stimulation through activities and resources as intervention alternatives based on the review and analysis of national and international literature by various experts. The methodology used was the bibliographic review using databases such as Scopus, Scielo, Redalyc, Dialnet, EDUSER, Researchgate, academic Google, among others. Likewise, 45 articles, 3 doctoral theses and 2 books have been reviewed, in different languages such as Spanish, English and Portuguese. The years of publication range from 2011 to 2021 and the countries are diverse such as: Ecuador, Colombia, Brazil, Cuba, Spain, Peru, among others. The search strategies were va: keyword, theme and follow-up of the bibliography of a base document. The results lead us to the theoretical depth of the subject and to greater clarity regarding the relevance of perception to strengthen reading and writing. It is concluded that the acquisition of reading and writing are linked to a good development of the ability of visual perception, so the intervention of teachers is essential to stimulate it adequately and to reduce possible problems in reading and writing.

**Keywords**---perception, visual perception, perceptual systems, reading and reading, intervention.

## **Introduction**

Currently, it is necessary to acquire various skills to achieve good learning, therefore, it is essential to prepare students so that they can face different tasks that the school learning process requires (Tortosa, 2018). From the beginning of their lives, girls and boys gradually acquire various skills, which are necessary to face and solve different scenarios that arise daily, for this reason it is necessary to sensitize professionals related to the training of learners the importance of proposing various activities to stimulate the sensory process (Agudelo, Pulgarín and Tabares, 2017). The daily activities that the students carry out need the visual system, being the sense of vision one of the most important because the actions that they carry out in their daily life obey the stimuli that are captured by the retina, which will later be analyzed and evaluated. channeled by the visual cortex (Merchán and Henao, 2011). Therefore, sight not only incorporates information through this sense, but also involves the development of twenty skills, including visual perception and 65% of brain links (Quevedo, García, Jiménez and Perales, 2016) for this reason almost 85% of all the activities that the student distinguishes, understands and remembers needs the capacity of the visual system (Vergara, 2008).

Visual perception is the ability to receive sensory and cognitive information through the senses, based on visual stimuli, cognitive components (visual attention and memory), differentiate concepts through visual analysis of the person's perception (permanence of form and background) and knowledge of the place (Garje, Vishnu, Rashmi, Arpita and Maninder, 2015). Similarly, it is considered as the process that leads to the brain the environmental stimuli so that the individual can identify, process and give meaning to sensations. collected on the basis of previous experiences (Esquivel, Heredia, Ancona and Lucio, 2016). Other authors consider that it is the power that the subjects have to examine everything that is around us through the stimuli captured by the sensory systems allowing learning (Fajardo, Novoa, Uribe and Fuster, 2019), they are also influenced by the personal experience of each person, which is why learning develops and progresses over time based on the personal experiences of each individual (Ramírez, Arteaga and Luna, 2020). To achieve this learning, the ability of visual perception is needed to observe, deepen, recognize, differentiate and evoke what the visual system perceives. (Aribau, 2018).

Multiple investigations highlight the importance of initial education, as a period where the intellectual characteristics of the individual are developed at first and as the first step of preparation for primary education where the child is provided with knowledge and the formation of capacities, abilities and personality qualities (Romero, Mariño and Moreno, 2019). Therefore, the optimal development of perceptual skills favors the acquisition of new knowledge and facilitates the increase of cognitive processes to achieve good learning (Silva, Oliveira and Ciasca, 2017). However, the problems that are generated by the scarce or null development of visual perception in the field of primary education, especially in

the first grades, affect the first phases of learning, where they begin to develop activities as basic and important as reading and writing. (Aribau, 2018; Fernández, García, Jiménez and Perales, 2016). The acquisition of literacy is a complex process related to coordinated movements, spatial organization and the proposal of a group of cognitive and sensory skills, one of them being visual perception (Ovalle, 2020). This ability is necessary to achieve the competencies, but its deficiencies are increasing, becoming an educational problem in many public and private schools (Lastre, Romero, Ríos, Martínez, & Campos, 2020). Therefore, if students have affected perceptual skills, they can present learning problems in the classroom, becoming the first cause of school failure because 75% of all school training is visual (Stensaas, 2019, Macías and Cuellar, 2018).

On the other hand, the pandemic has caused negative effects on the progress of all the countries of the world (Picón, González and Paredes, 2021). Therefore, governments spoke out and implemented emergency measures such as confinement and social isolation to prevent the spread of the virus (Aguerreverre, Amaral, Bentata, and Rucci, 2020). The fact that schools were closed for a long period affected one thousand two hundred million students worldwide and increased the existing inequalities in the progress of skills, mainly in those who live in less favored conditions (Cifuentes, 2020, Picón, González and Walls, 2021).

This situation also affected our country in economic, cultural and especially social development with respect to education (Bautista, Santa María and Córdova, 2021) due to the fact that two hundred forty-five thousand students hindered their learning and four hundred sixty thousand were found to be at risk (School Alert, 2021). For this reason, the government adopted some actions so that the educational service can continue, one of them being the transition from face-to-face education to non-face-to-face education so that students can continue with the teaching and learning process (MINEDU, 2020). Another action was to make available the "I learn at home" strategy, which was broadcast on television, radio and platform (Bautista, Santa María and Córdova, 2021), however almost 50% of schoolchildren followed the programs online. television and the other 50% homework through the platform (MINEDU, 2020), additionally only 43% have connectivity and 21% of students have a computer with internet at home (Educational Census 2020). However, despite all the efforts, there was a significant loss of learning, limiting the progress of reading and writing skills, reaching levels of reading comprehension similar to the year 2012 (World Bank, 2020, Bautista Santa María and Córdova, 2021)

In this sense, the research is carried out whose professional interest is the concern about the different difficulties that our students present in their learning process, these will be addressed through the review of various sources that will provide relevant information on the subject addressed in this research. . The bibliographic review is a systematic research methodology for the selection and exhaustive analysis of information in the theories, results and conclusions of various scientific articles published in recent years on a topic related to a common theme with the intention of obtaining important information that contribution to solving a problem (Ocaña and Fuster, 2021). For this, a bibliographic search was carried out during the second semester of the year 2021 in scientific articles of different languages, doctoral theses and books that were

published between the years 2011 and 2021 using various databases and repositories of reliable universities in order to have studies made on the ability of visual perception and the appropriation of reading and writing.

This research is proposed with the aim of explaining the concepts of visual perception, the problems that may arise if they are not developed properly, and stimulation through various activities and resources as intervention alternatives based on a bibliographic review of various investigations.

The topics that this article will address will be the concepts of the ability to perceive, visual perception and language skills such as reading and writing. In the same way, the processes, theories, systems and abilities of perception, difficulties, causes, consequences, activities and resources such as games and the use of ICT to develop and overcome the difficulties encountered in relation to the research topic.

## **Method**

This research started from an exploration of specialized documents with the purpose of having specific information on the contributions of different authors on the ability of visual perception. The methodology used was the bibliographic review, which is a systematic, exhaustive and reproducible investigation of the documentary literature related to a specific theme or issue, which contributes to the advancement of science due to the cumulative nature of a series of academic products published in recent years. on a selected topic to obtain relevant information that contributes to the solution of a problem (Codina, 2020). To locate articles, a bibliographic search was carried out during the last three months of the year 2021, as well as a bibliographic search to access primary sources in different databases such as Scopus, Scielo, Redalyc, Dialnet, Eduser, Researchgate, among others. . Additionally, articles were identified in other sources: academic Google and repositories of different universities. To obtain a greater number of articles focused on the subject, the following keywords were used: perception, visual perception, linguistic skills, reading and writing. In a first search, a total of 74 articles, 4 doctoral theses and 2 books were obtained through the strategies mentioned above. For this study, the investigations underwent a filter and selection process that met the eligibility criteria through a process of validity and reliability of the information, in this way 30 articles and 1 doctoral thesis were excluded because they were not related to the study. Finally, 45 articles, 3 doctoral theses and 2 books were accepted, which met the following inclusion criteria: having access to the full text of the article allowing obtaining varied information from various authors regarding the concept of visual perception as well as reading and writing , publication of articles written in different languages such as: English, Spanish and Portuguese, take into consideration the articles that have the title, abstract and/or results related to the topic under review, include the academic production of different countries of the world in indexed journals and that they will deal with the subject; and the publication of articles in the database between the years 2011 and 2021.

## Development and discussion

After a review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books, it was possible to create a general graph with all the information on *visual perception for learning to read and write* considering the following categories: type of document, year of publication, database, search strategies and production by language .

In this section we begin an approach to the *Different views of perception*, after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. For this, some aspects were considered, such as: the name of the authors, type and year of publication, information search strategies, country and database.

Various authors have addressed studies on perception, with a total of 7 articles and 1 book published between 2011 and 2020 that are directly linked to the conceptual definition of perception. Some of them consider it as an operation, process or capacity. Perception is a simple, innate and sensory operation that originates at the level of the senses, these perceptual operations are developed according to the cognitive level of people (Álvarez, 2016), however there is a contradiction to this perspective since it does not they consider it as a simple operation but as a complex activity and not at all simple, because faced with a set of stimuli the individual focuses on one or some taking into account their interests and needs, in such a way that not everything we receive Through our senses, a procedure of difference, understanding and analysis begins (Rosales, 2016). Other authors consider perception to be a cognitive process through which people capture all the information from their environment through sensory systems, allowing the representation of characteristics and properties of objects (Romero, Mariño and Moreno, 2019). It is also considered as the first process by which children manage to receive, elaborate and interpret information when they come into contact with their environment captured through stimuli through the senses (Vásquez, 2013; Alonso, 2011). Form perception is not only a cognitive process but an active one that helps the subject to locate and select what is observed in the environment organized by visual systems (Merchán and Henao, 2011) . On the other hand, perception is linked to brain action that allows the entry of information from the environment and this in turn creates concepts through learning, memory and thought, therefore the reception of information involuntarily produces a selective reaction to information (Agudelo Gómez, Pulgarín, Posada and Tabares, 2017). Finally we can mention that perception is considered as the ability to interpret everything that is around us through the senses, allowing people to obtain information from the environment to which they belong and thus facilitating learning (Fajardo, Novoa, Uribe and Fuster , 2019). In conclusion, we can state that perception is a cognitive and active procedure that enables discrimination, deliberation and interpretation of external stimuli captured by the senses, allowing the acquisition of knowledge and thus facilitating learning.

In this section we will deal with the *Conceptual Approach of visual perception* , after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. For this, some data were considered such as: the country of publication, name of the authors, database, type and year of edition.

There are several authors who have addressed studies on visual perception, with a total of 9 articles and 1 book published between 2011 and 2020 that are related to the meaning of perception. We will start by defining visual perception as a dynamic procedure that allows capturing stimuli from the environment and takes it to the brain, which in turn transforms this information through actions of discrimination and interpretation, associating it with its lived experience. (Alonso, 2021; Medrano, 2011 ). On the other hand, visual perception is considered as an ability that consists of discriminating and interpreting the stimuli captured visually and influenced by the experiences lived and the emotional aspect of each person, in this way the learning is developed and perfected in relation to the acquisition of experiences over time ( Ramírez, Arteaga and Luna, 2020; Mera and Gómez, 2020). Similarly, it is an ability to identify, discriminate and interpret objects in their environment and their characteristics at a visual level that causes a processing, interpretation and transformation of information in the brain (Fajardo, Novoa, Uribe and Fuster, 2019), a clear example being the preschooler who learns to explore, identify and differentiate objects and forms visually as he matures and interrelates with the environment by providing him with a variety of information (Vásquez, 2020; Mera and Gómez, 2020; Romero, Mariño and Moreno, 2019 ), also comprises a set of sub-skills that are combined to interpret, constitute and condense information efficiently (Jadue and Figueroa, 2017) considering their previous experiences to produce new knowledge and influence the first phases for the acquisition of learning such as reading and writing (Cuellar, 2018; Orellana, Vega, Condorchúa and Carpio, 2019). In short, we can express that visual perception is a process, capacity or ability to recognize, discriminate and interpret the stimuli from the environment that are transferred to the brain, which transforms the information and gives it meaning by relating it to previous learning and the mood of the people. people.

In this part we provide information on the *Processing of visual perceptual abilities* , after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. For this reason, aspects such as: names of the author, year and type of dissemination of the article, database, information search strategy and country have been taken into account.

Several have been the authors who have addressed studies on the processing of visual perceptual skills, for this reason 2 articles and 1 book are associated with this topic. Some authors point out that visual perception begins in the sense of sight when light arrives, the nerves of the retina are stimulated, converting an electrical conductor into a light conductor that is transmitted to the optic nerve, leading it to the brain, locating it in a nexus called chiasm and subsequently it is conducted to a part of the thalamus where it is sent to the visual cortex found in the occipital lobe. This process occurs in three periods (Alberich, Gómez and Ferrer, 2014; Romero, Mariño and Moreno, 2019)

On the contrary, there is an author who expresses that the perception procedure needs and evolves in the second functional unit that is found in the lateral regions of the neocortex in the area of the hemispheres encompassing the consecutive areas. This secondary unit, like other units, consists of various areas:

primary (projection), secondary (projection and association) and the tertiary (overlapping zones) (Macías and Cuellar, 2018).

Table 1  
Process Areas of Visual Perception

<b>PRIMARY AREA projection</b>	<b>SECONDARY AREA Of projection and association</b>	<b>TERTIARY AREA overlapping zones</b>
<ul style="list-style-type: none"> <li>❖ They receive the information.</li> <li>❖ They encompass the neurons of the fourth layer.</li> <li>❖ They respond to visual stimuli related to color, shape and directions.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Overlaid on the primary area.</li> <li>❖ Responsible for discriminating visual stimuli.</li> <li>❖ Categorize and transform visual stimuli.</li> </ul>	<ul style="list-style-type: none"> <li>❖ They are in the temporal and postcentral cortex.</li> <li>❖ It depends on the growth of the individual.</li> <li>❖ Important to integrate information transmitted by the brain through vision.</li> </ul>

We can infer that perception undoubtedly begins with the organ of the eyes and requires going through three stages: photoreception, transfer and information processing; and the elaboration of information and perception. In addition, this process consists of three very important areas, the primary area referring to the projection of what is observed, the secondary area related to projection and association, and the tertiary area corresponding to the overlapping zones.

In this section we will address the *theoretical references of visual perception*, after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. in such a way

Some data has been taken into account, such as: database, authors' names, year and type of publication, information search strategy and country.

We can mention that 3 articles, 1 doctoral thesis and 1 book clarify the subject on the theories of visual perception. In the first place we will mention Gibson's theory called "ecological approach" of perception that recognizes it as an interactionist and action position fixed on the information found in outer space. The author defends that the values and meanings of things in the environment can be appreciated directly and related to the action of the individual. Likewise, perception is not merely sensory but involves other processes such as the intentional and cognitive (Rosales, 2015). Therefore, Gibson rejected the traditional principles on which perception was based on sensations, "on the contrary, he assumed that it is based on information from the environment, considering it as everything that is around the observer, so it is important to know that abroad there is abundant information, stable and permanent. These stimuli are within reach and it is important that the individual be able to explore in various ways through their eye movements, head movements and movements

with their body. In this theory, Gibson proposed the definition of environmental optical arrangement, which is the light found in the environment. This arrangement conducts the information that the person collects through constant observation of the environment and in the displacements that he or she makes, constant transformations of the environment originate. Visual field. Finally, these transformations depend on the movement carried out by the observer and a part of the arrangement is given by the movement of the object. (Yuan, 2019) . Secondly, we will take a look at Gestalt theory, which emerged at the beginning of the twentieth century in Germany as part of modern psychology, its great exponents are Max Wertheimer, Wolfgang Köhler, Kurt Koffka and Kurt Lewin, as well as the meaning of Gestalt It has several interpretations among them understood as "figure", "background" or "structure". This holds that people have receptor cells for each of the senses which have their own pathways and nerve endings that are transmitted by nerve impulses associated with memory where they store past experiences and sensations. All learning occurs through interactions between already acquired learning and new knowledge, which is why it is stated that perception is related to sensation and cognition. The representatives of this theory managed to demonstrate that perception works as a whole and not in parts, another important aspect is that it is linked to the structure of the information that comes from the outside through a simple mental evocation. That is why, in a general way, we can express that perception arises as a consequence of the way in which the individual organizes the information that comes from the environment through cognitive schemes, achieving conceptualizations, from which the laws of perception are established, which are those that let us know how the various visual stimuli are grouped into functional units (Alva, 2018; Alonso, 2011; Alberich, Gómez and Ferrer, 2014) . We can affirm that Gibson's theory called "ecological approach" is based on the recognition of the environment that allows information to be carried according to the observer, also this requires other processes such as cognitive and intentional. For its part, the Gestalt theory broke the paradigm that perception only focused on the sensory and based on its findings, they consider that perception was the first step for mental activity, for which people internalize what happens in the world, concluding that perception determines our thinking.

In this section we will arrive at the subject of *Visual Perceptual Systems and Abilities* , after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2. Likewise, the data considered are: year of publication of the article, names of the author, database data, search strategies and country.

Several have been the authors who have addressed studies on the processing of visual perceptual skills, so 6 articles cover this topic. Next we will see how they are classified.



Table 2  
Visual Perceptual Systems and Skills

<b>Laura Bravo Coppola 2004</b>		<b>Susana Merchan and Luis Henao 2011</b>		<b>Garzia 1994 cited by Patricia Bustamante and Francis Ortiz 2018</b>	
<b>Systems</b>	<b>Skills</b>	<b>Systems</b>	<b>Skills</b>	<b>Systems</b>	<b>Skills</b>
visuospatial system	- Directionality -Laterality	visuospatial system	-Address - Orientation sequence	visuospatial system	-Bilateral integration -The laterality - Directionality
Visual analysis system	-Visual discrimination -Figure background -Visual closure -Constancy of shapes	Visual analysis system	-Shape perception -Visual attention - perceptual speed -Visual memory	The visual analysis system	-Shape perception -Visual attention -perceptual speed -Visual memory
visuomotor integration	-eye-hand coordination			The visual and motor system	-Shape perception -Fine motor coordination -Integration of visual and motor systems

The skill of perception is divided into the following systems: the visuospatial system, is a set of skills that help to understand the notions of the different directions such as right-left, up-down, front-back; that are found in the environment and that help us to develop in the environment. This allows them to get to know their body through the relationship with space and between objects and it. This system is subdivided into: bilateral integration (allows us to use both sides of the body helping to discern the difference between the right and left side), laterality (allows us to know the sides of the body on itself) and directionality (allows us to identify directions). These skills are related to reading and writing due to their relationship between spatial notions and the visual system (laterality and directionality). On the other hand, a person with deficiencies in these abilities can confuse some notions such as forward-backward, up-down, right-left and have difficulties in their writing, confusing letter directions and their organization in the space of the paper. Another of the systems is the visual analysis system, referring to the set of skills that allow looking at the differences and similarities between objects, shapes and symbols, as well as remembering and re-visualizing

them. This system is subdivided into four skills: shape perception (allows to differentiate and identify the shapes of objects), perceptual discrimination (allows to observe the figure and its background), visual attention (allows to search for stimuli during the information process), perceptual speed (allows you to perform actions quickly when processing information and with minimal cognitive effort) and visual memory (allows you to observe a material and remember it easily, they can be of two types: spatial memory where they remember where an object is in space and sequential memory which helps to remember items in a sequentially organized manner from right to left). This system allows processing the information captured by the vision during reading and providing an interpretation of the text, giving rise to the learning process. Finally, the visual and motor system as the coordination of visual and motor skills achieving visual-motor integration producing complex visual patterns that work together for better results in pattern imitation. This requires skills such as the perception of form, fine motor coordination and the integration of visuomotor systems allowing actions such as transcribing numbers and letters. These will allow us to perform eye-hand coordination tasks that are important for writing, involving coordination between verbal, visual, and motor aspects ( Bravo, 2004; Merchán and Henao, 2011; Garzia, 1996, cited by Ortiz and Bustamante, 2018 ). However, one author mentions that visual perception is related to the tasks carried out by people, especially students in school, and this is subdivided into 5 skills, which Gestalt theory calls dimensions.

Similarly, each of these dimensions has subcomponents that are various skills, which we can see in the following table.

Table 3  
Subdimensions of visual perception

<b>Visual-motor coordination</b>	<b>Discrimination figure background</b>	<b>shape constancy</b>	<b>position in space</b>	<b>Spatial relations</b>
-Coordination of the eyes and hands.	-Discrimination figures taking into account their shape.	-Recognition of certain geometric figures.	-Relationship of an object in space with respect to the observer.	-Analysis of forms in relation to the body and its own space.
- Synchronization under trajectory and movement parameters.	-Discrimination figures taking into account their background.	- Differentiation of geometric figures from others.	- Differentiation of swaps and rotations of figures that are presented in series.	-Analysis of patterns in relation to the body and own space.

Visomotor Coordination implies controlled movements, that is, it allows the coordination of body movement through visual stimulation that allows children to execute simple and difficult actions. This results from the coordination of vision and touch (eye-hand) to have balance and strength with great precision. When

actions of the eye, hand and fingers are generated at the same time, students can perform tasks such as cutting, painting, tearing, gluing, etc; These activities will serve to begin the acquisition of writing. However, when students have difficulties related to simple motor skills, they have trouble thinking and therefore cannot concentrate on the designated task. For a better development of the visual-motor ability, activities should be carried out in which the eyes and hands must be used at the same time, this action allows the brain connection that facilitates eye and manual movement; this is an important complex cognitive skill for school learning that is important to stimulate and improve. However, it is still essential in our day to day life even when we are adults to control movements in a small space such as paper by drawing various parallel continuous lines already established, these require skills such as directionality. Figure background discrimination involves finding figures that are located in the background, this helps concentration and attention, so it is necessary to develop it properly so that the student can locate an object or figure within others. For this, we must propose to students activities related to the discrimination of figures taking into account their shape (skill in which objects must be differentiated based on their characteristics and properties) and the discrimination of figures taking into account their background (consists of compare the element by means of the information presented that allows the subject to obtain it in a sensory way). Form constancy allows people to identify simple figures considering their shapes, sizes, shading and positions in space, the important thing is to recognize these figures despite their variations. Students who do not develop these skills may have deficiencies in the recognition of letters and numbers that are frequently inverted. As mentioned above, it is considered necessary to develop this skill through activities such as: recognition of certain geometric figures (recognition of two-dimensional figures ) and differentiation of geometric figures from others (comparison of geometric figures based on their shape or elements: straight sides and curved sides, number of sides and vertices). The position in space , referring to the location of an object or body depending on the objects according to the place where the object is located, allowing you to develop knowledge related to spatial notions related to spatial orientation such as up, down, in front, behind, right and left, these notions are important for the child's learning because it allows him to identify the area in which he is located, allowing him to have difficulties in identifying symbols or making human figures, it is also essential that they recognize his right and left but it is important to know that these notions are acquired until they are 6 or 7 years old. Finally, spatial relationships refer to tracing lines and angles that will be acquired from less to more through an analysis of shapes and structures that are simple at first. There are aspects related to spatial relationships such as the position of objects in relation to how to recognize and reproduce shapes, allowing people to orient themselves in space and improve their learning (Frostig cited by Fajardo, Novoa, Uribe and Fuster, 2019; Crespo, Moinelo, Morales, Gómez, Pulido, Torres and Francia, 2019; Cenizo, Ravelo, Ferreras and Gálvez, 2019). To conclude we can mention that the perceptual ability begins in the eyes and to transform the information it needs various systems, these are organized into visual skills and sub-skills that determine in a complex way the level of analysis of sensory information to achieve optimal processing and In this way, acquire new knowledge.

This section covers the topic of *Visual Perception in daily life*, after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. For this, data such as: country, names of the authors, year, database and information search strategies have been taken into account.

6 scientific articles have been taken into account, those that are linked to visual perception in daily life. That is why it is necessary to know that visual perception intervenes in a large part of the activities that children carry out, allowing them to distinguish objects and their characteristics (textures, colors, sizes, smells and flavors) through their location, this information is captured by the vision through proper organization and processing, optimally contributing to their development and formation of higher cognitive processes such as intelligence and thought ( Merchán and Henao, 2011; Alenizi, 2019; Pascual, Madrid and Estrada, 2018). However, it not only helps the recognition of objects but also the verbalization of facts and events in the world around him, favoring new knowledge, one of them being reading, which will help him to function in other areas as long as there is an interaction between diverse skills ( Romero, Mariño and Moreno, 2019; Otoni and Marín, 2020; López, et. al, 2020). On the other hand, visual perception stimulates visual literacy precisely in preschool age, being essential for other future skills such as interpretation and reflection, based on experiences of daily life, this will help the acquisition of guidelines and cultural values that go to mark their future life ( Soto, 2016). It is important to mention that visual perception must generally be acquired at six years of age and in subsequent years it must be perfected through personal experiences lived in their daily lives, contributing to the gradual structuring of motor, cognitive and language skills ( Ramírez , Arteaga and Luna, 2020). It is concluded that the actions that we carry out on a daily basis are related to visual perception, which allows us to acquire new knowledge related to previous experiences, these are generated through the deployment of increasingly complex cognitive processes. It is enabled and is linked to our lives since not only knowledge is obtained but it also allows the verbalization of facts and events that happen around them .

This section deals with the *Causes and consequences of poor visual perception*, after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. Considering the following categories: database, name of the authors, country of origin, year of publication and information search strategy.

Regarding the causes and consequences of poor visual perception, it was determined that 6 articles published in 2019 and 2020 directly explain the subject to be addressed. It should be noted that there are many causes that cause difficulties in visual perception, the most common being external factors and the action of the teacher. Regarding the first, the United Nations Organization (2015) mentions that in the Americas and the Caribbean, children between the ages of three and six are in risky environments because they have not had access to quality education despite efforts implementing intervention programs have not been able to overcome difficulties in some skills or consolidate other learning. Similarly, UNICEF (2011) expresses that there is a higher percentage with school due to poor nutrition affecting growth, cognitive development and the development of skills, one of them being learning to read and write (Fajardo, Novoa , Uribe and Fuster, 2019). Likewise, it is appropriate to mention that the

pandemic has caused a crisis in all spheres and the field of education has not been different from it, this gave rise to a massive closure of school activities in the schools in one hundred and ninety countries with the aim of preventing transmission of the virus. This situation caused more than one million two hundred thousand students to drop out of school, which caused the loss of various skills, including visual perception. On the other hand, the second cause has to do with the work of the teacher because they do not have adequate planning in which they incorporate activities for the progress of perceptual skills, as well as the little use of games, disciplinary ignorance about the sensory process. in children and initiatives for perceptual improvement from the aspects of memory, imagination, thought, which affects the cognitive development of the child (Romero, Mariño and Moreno, 2019)

The consequences that can result if we do not adequately develop visual perception are: delay in the child's development, learning problems and the interpretation of visual stimuli in their environment. A clear example is that 6% of the school population presents a disturbance in the coordination of development and deficiencies in the motor skills that intervene in the tasks that we carry out on a daily basis and emotional difficulties due to the fact that they are frustrated by some school activities, adding to this anguish and restlessness in parents and teachers (Alenizi, 2019; Alesi, Gómez and Bianco, 2020; López et. al., 2020), as well as errors in the reading process producing omissions, substitutions, regressions, among others deficiencies that occur when reading (Grimaldo and Sepúlveda, 2019). We can conclude that the deficiencies that students present regarding visual perception are caused by some external factors such as inadequate nutrition and the pandemic that has not allowed children to develop their skills, in addition, the work of the teacher is a negative factor due to that do not have a planning of activities or tasks to stimulate this ability. These causes bring various consequences, especially in cognitive development, producing difficulties in motor skills that hinder daily actions and in perceptual skills that cause emotional stress, affecting school performance and therefore learning.

This section deals with *reading difficulties due to visual perception* , after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. For this, the database has been taken into account: country of origin, names of the authors, information search strategy and year of publication.

Different authors have addressed issues about reading difficulties due to visual perception, identifying a total of 6 articles published between 2014 and 2021, explaining this topic in detail. We know that the reading process involves a set of cognitive and sensory skills to optimally achieve this communicative competence, however there are frequent difficulties, becoming a very common educational phenomenon in most public and private schools. These difficulties arise during the period of reading acquisition with respect to the grapheme and phoneme component that are important for students to build their words, phrases and sentences. In addition, when reading the texts, they invert the graphemes or syllables, confuse letters, the pronunciation and stress of the words, causing them to be unable to understand what they read and therefore have poor reading performance . (Lastre et al., 2020). In the same way they have the difficulty of appropriating the alphabetic code and the meaning of words because they have

problems integrating the word as an element of reading comprehension, this happens because the child loses attention to the words during visual observation and thus way to carry out an adequate phonetic and lexical process through sight due to the alteration of the perception of the form when discriminating the letters that are similar, for example between m and n, p and b, reflecting delays in reading speed and comprehension. (Ramírez, Arteaga and Luna, 2020). Another difficulty that arises in reading due to a poor development of visual perception is dyslexia, which is caused by deficiencies in word recognition in a fluent and precise manner, spelling and decoding problems, these deficiencies arise from root of the phonological component of the language that occurs when reading and understanding a text, it also causes poor language that hinders the development of vocabulary and presents as weakness the crossed laterality or low motor coordination (López et al., 2020). It should be noted that people who have reading difficulties experience phonological and orthographic deficiencies, showing deficiencies in the speed of processing information (Horowitz, Vannest, Kadis, Cicchino, Wang, & Holland., 2014). It is appropriate to mention that perceptual skills help the child to identify and remember what he observes, as well as the elaboration of correspondence rules between phonemes and graphemes, which allows fluency, however if there is not a good development of this, it will affect the reading because it helps a lot to recognize words. However, it has been found that children fail to recognize simple symbols such as p and q (Bora, Cardoso and Marco., 2019; Guartazaca., 2021). We can infer that there are difficulties in reading because some previous skills such as visual perception have not been stimulated, these deficiencies occur at the time of reading when a child has not managed to appropriate the writing system, so they confuse the syllables and letters. , the alteration of its form, discriminate letters that are similar since they do not pay attention to the words for a certain time, this is due to the alteration of the perception of the form. This can lead to the problem of dyslexia in children as they have difficulty recognizing words accurately, this is reflected in a low ability to read speed by not understanding what they read, causing complications in future learning in relation to other areas.

This part of the review relates to *Writing difficulties due to visual perception*, after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. Considering the following data: names of the authors, year of publication, database, information search strategies and country of origin.

Several authors have carried out research related to the difficulties of writing due to visual perception, for which it was determined that there are 6 articles disseminated between the years 2017 and 2020 that reveal relevant aspects of the subject matter. That is why we must start by mentioning that the writing process is related to visual-motor coordination through the precision it performs in controlled movements in which the eye and hand are used synchronously that help to write words. Motor development must be adequately stimulated to achieve the acquisition of writing because they favor balance, coordination and spatial orientation. However, there are children who have problems in fine and gross motor skills since they are not stimulated at the school level (Ramírez, Arteaga and Luna., 2020; Macías et al., 2020). Another difficulty that students show in writing are: failures in the modification of grapheme and phoneme, poor calligraphy and spelling, substitute or invert graphemes or syllables, confuse

letters and are very slow when tracing the letters causing the alteration of words and often written production is not understood because they are not clear about their writing objective, that is, they do not have the ability to organize their ideas of a text (Lastre et al., 2020). If these difficulties are constant, they could have a dysgraphia problem, which is a writing ability disorder characterized by difficulties in constructing written texts that can occur in modifications related to the production of words, planning processes, writing and review (Rivas and López., 2017). These are manifested in a confused readability in the writing due to the construction of words and sentences incorrectly due to the poor precision of graphic movements, this situation worsens in higher grades due to the demands of writing (Ramírez, Arteaga and Moon., 2020). Psychomotricity helps to stimulate the nervous system through movements that help the development of affective, social, cognitive and motor areas that generate motor and language processes. That is why visual perception and psychomotricity are part of the neuropsychological development of children because the planning and execution of motor movements helps to acquire visual information that helps strengthen perception skills that determine movements (Bora, Cardoso and Marco., 2019; Gago and Elgier 2018). In conclusion, writing depends on a good development of visual-motor coordination due to controlled movements that are carried out with precision, however there are children who show deficiencies in fine and gross motor skills, generating difficulties in the legibility of a writing, manifesting itself through an inadequate construction of words and sentences, causing digraphia characterized by the deficiency when writing written texts where the letters are substituted or inverted when making the strokes and the production is not understood. Visual perception and psychomotricity are part of the child's development because the organization and execution of movements allows information to be obtained through vision, which allows the development of writing.

This section deals with the *stimulation of visual perception through games and the use of ICT*, after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. For this reason, the following categories have been taken into account: name of the authors, year of publication, information search strategy, database and country of origin.

11 articles published between 2014 and 2021 have been taken that explain the stimulation of visual perception through games and the use of ICT. The stimulation of perception is important for children's progress, for this reason the school stage is the right time to develop it properly because it influences later phases of their lives since they are perfected and consolidated. Comprehensive development is produced by the stored experiences of people for this reason the resource of the game can be very powerful for the development of skills. The game is a means is an important means for the progress of their individual abilities, to acquire and specify the knowledge of the immediate environment and an effective means to assimilate them. In the same way, it is an expression of the actions of the child's thought where intellectual speed, creativity, perseverance in the activities carried out, feelings and different behaviors are activated, favoring learning by consolidating the cognitive processes of girls and boys (Quintero, Ramírez and Jaramillo, 2010). Definitely, the game becomes important at school age because a better internalization and deepening of knowledge can be obtained

in a varied and constant way, in addition its application achieves greater participation in the students (Cuellar, Tenreyo and Castellón, 2017), fulfilling a developer function. , formative and didactic because it is developed under previous conditions, generating the progress of skills and the formation of values and feelings of people, and most importantly, making it useful for work and social life. However, there is evidence of a poor integration of the game with visual perception in children's circles since the game is only worked on as a form of child development, but it is not aimed at strengthening the ability of visual perception Playful activities favor development children, the methodological training of teachers for school work, the generation of a favorable climate and motivation providing confidence in the tasks performed and ensuring the progress of skills. That is why it is important to use the game to stimulate visual perception and develop it in a fun way, promoting creativity, criticality, imagination and understanding of spatial and geometric thinking where it is not only a way to solve various problems related to location, orientation, location or representations. that children face in their daily lives, guaranteeing learning related to reading and writing in an entertaining, dynamic and didactic way (Romero, Mariño and Moreno 2019; Macías et al., 2020; Uribe, Cárdenas and Becerra, 2014) .Consequently we can mention that the game is a very powerful resource for the acquisition, internalization and deepening of knowledge through the active participation of children. The game is a main means for the development of various capacities because it helps to express thought through actions. However, it is observed that there is a poor integration of this resource with visual perception in the group of school-age students where the game is worked in isolation and not to strengthen the ability of perception. Technologies have caused spaces of life, this has originated a wide range of tasks that are related to learning, modifying the tasks carried out with pencil and paper. These technologies provide many possibilities 'to generate the progress of some skills and abilities that are difficult through traditional means, becoming instruments for the educational system (López et al., 2020). In this sense, it is important to take them into account to integrate them into the education of students, as they help improve and consolidate skills, including the motor skills that they contribute to reading and writing because they arouse interest in being multimedia products (Fang , Wang, Zhang and Quin, 2017). However, despite the exploration of ICT in the educational environment, there is still no positive correspondence between the school and the use of technology, since some teachers continue to use traditional teaching resources; blackboards, notebooks, books and other paper materials ignoring the benefits of ICT and the motivation it generates in children due to the closeness when using these resources. Thus, for example, exercising manual eye coordination skills can be done using the computer mouse as a digital clamp Another aspect is that teachers, when considering technology in the teaching of certain skills, consider that these tools are not clear with Regarding the content and the educational purpose, this happens because they do not classify the activities according to age, cognitive level of the tasks and the previous experiences that are needed for their use according to the knowledge that is to be reinforced (López et al. , 2020). On the other hand, it is important to continue implementing methodologies and strategies that take into account ICT resources to improve visual perception skills, which is a field that has contributed significantly to improving other learning deficiencies in students ( Boyes et al., 2017). It is also important that



teachers incorporate digital tools and resources in their teaching practice because it favors improving certain learning deficiencies (Campos, Torres and Morales, 2021). So the new educational paradigm proposes to incorporate technologies in teaching and learning with the use of programs and applications in the classroom as creative and innovative resources for the development of skills (Colorado and Mendoza, 2021), in this way, children are adequately motivated and learn challenges where the solution is not easy to find, so it is important to consider the role of technology in the consolidation of visual literacy at school (Soto, 2018). In conclusion, we can affirm that ICTs came to the educational field to be able to use it in teaching and learning, it provides opportunities to generate the progress of some skills and abilities that cannot be achieved in a traditional way. It is important that teachers can integrate them in order to consolidate some skills, including motor skills and others, because they arouse interest in students. These can be implemented through programs and applications as creative and innovative resources to strengthen skills such as visual perception .

This section deals with the *Proposals for intervention using ICT for the development of visual perceptual skills*, after the review and exhaustive analysis of 45 scientific articles, 3 doctoral theses and 2 books. For this, a database has been taken into account: names of the authors, country of origin, information search strategy, database and year of publication.

Regarding the Proposals for intervention using ICT for the development of visual perception, 5 articles published between 2018 and 2021 have been taken because they make us aware of this topic. The difficulties presented by students related to visual perception can be addressed preventively by teachers through intervention programs with the purpose of providing them with support to avoid various subsequent problems in their learning, in turn incorporating technology to pose the activities related to the content to be worked on (Escobar, Carvajal and Obando, 2018). Below are some proposals for intervention with the use of ICT .

Table 4  
Intervention proposals using ICT for the development of visual perception

	GRAPHOMAGY	PERCEPFigure	MULTI-SENSORY PROGRAM	GEOGEBRA
What is?	Visual and motor perception training program.	Computerized visual stimulation program.	Training program for the progress of visual perception.	Program for algebraic calculation, symbolic calculation and gamification in two and three dimensions.

For what do you use it?	Helps to progress the skill of perception.	Evaluate the behaviorally and electrophysiologically the multistable perception.	Develops perceptual skills for students with deficiencies in this skill	To find patterns in various figures with a background.
How is it used?	Through the application of software and speech therapy	Using a computerized visual stimulation program	By using software to stimulate the visual part.	Using digital software with templates to interact virtually and identify patterns.

For a better understanding of these intervention proposals, we will point out each one of them: The first intervention proposal is called "Graphomagia", a training program for the progress of visual and visuomotor perception through the application of software and speech therapy so that teachers can have the opportunity in technological resources. This program has tasks related to visual motor coordination such as: tracing a path from a figure to the end of a linear path and curves; in the figure background skill the activity is to repaint the figures found in the blurred backgrounds; in the shape constancy ability the task is to identify the elements that change their characteristics and in the spatial abilities where the activity is to identify the elements that are positioned according to the given model. The proposal consists of 25 sessions of twenty-five minutes for a period of one month, where students will be able to finish all the aspects (López et al., 2020). The second proposal is called "Percepfiguras", it is a computerized program for visual stimulation which consists of evaluating behavior and electrophysiological multistable perception. This tool allows the manifestation of the information and responses of those who participate to coincide with the records, it is important to be careful in the annotation of the behavioral responses and the brain activity associated with it. The program was designed to allow students to carry out some presentation tasks followed by visual information through presentations where various types of figures and multiple responses are observed. These are third-generation materials that allow the user to make an exhibition by choosing indications through the preset computer. In addition, for each execution of the tasks, the program automatically generates a file of the total responses for each type of figures with their respective averages (Ortiz, Rodríguez, Rodríguez, and Bernal, 2018). The third proposal called "Multisensory Program" has the purpose of purpose the development of visual perception for students with deficiencies in this ability. In the construction of the proposal, at the beginning, the number of sessions, the duration and the respective objective of each one were determined, after having the diagnosis of the current level of performance of the students participating in the program, the stability and flexibility that are needed for the application of the proposal, the use of materials and technological resources such as software. The sessions were divided into two parts of 40 minutes each. In the first part of the program students are expected to be able to infer factual information from a narrated text as well as relate the words used in the text and in the second part students are

required to identify the items of their daily life using various senses, It is expected that they can infer details related to the shape, size, color, materials and their components, among others, extracted from the images (visual stimuli) (Alenizi, 2019). Finally, the proposal of "Geogebra" as a powerful algebraic calculation program, symbolic calculation and gamification in two and three dimensions. In this proposal, a spreadsheet is used to explain a rectangular array and with the built-in digital tools it can quickly generate a matrix, then you can only request that the software calculate the determinant through an algorithm built into the system and from this This way, the result is obtained immediately, which in pencil and paper can be tedious and laborious. This proposal suggests using a non-static geometry system so that the teacher can create digital resources such as templates with which the students can interact virtually and that allow them to identify patterns by identifying numerical arrangements (Campos, Torres and Morales, 2021). In conclusion we can express that in the educational field there are various problems in relation to the development of skills, in this case the deficiencies in the ability of visual perception can be addressed in advance by teachers through programs in order to provide them with support to overcome them and avoid problems in the future in learning. Some programs that can help develop visual perception skills are: Grafograma (training program through software and speech therapy for the development of perception and visual motor skills), Percefiguras (computerized program for visual stimulation), Multisensory program (whose purpose is the development of perception through software) and Geogebra (program for algebraic and symbolic calculation through gamification)

### **Conclusions**

After the literature review on the subject we can conclude that visual perception is a cognitive process that is related to previous experiences and the emotional state of people, this allows them to give meaning to external stimuli allowing the acquisition of new knowledge as part learning, so we should not look at it in isolation but as a complement to both. So we can mention that visual perception is linked to the first phases of reading and writing because it helps to identify letters and words; Likewise, visomotor development is essential for the acquisition of writing.

On the other hand, visual perceptual skills are part of our lives because they are related to the greater number of activities we carry out, capturing all the information from the environment through the discovery of objects and their characteristics. This allows generating the construction of increasingly complex cognitive processes such as intelligence and thought, in the same way it helps to verbalize the facts and events that happen around them, positively influencing other knowledge that is being perfected in the future. .

The bases for the development of various skills, including visual perception, are given in the school stage where adequate development occurs and in future phases of their lives they are consolidated, one of them being reading, which allows them to clearly observe the symbols. However, a poor development of this ability could present difficulties when reading such as confusion, alteration and discrimination between letters and words because they do not focus their attention for a period of time caused by the perception of form. This situation,

being recurrent, can become a permanent problem, causing dyslexia as a deficiency to recognize words accurately, bringing negative consequences in reading speed by not understanding what they read, which causes future problems in learning fields of knowledge.

Considering that in the first years of schooling, writing skills are obtained and developed to communicate through written media, it is important to consider it as part of visual perception because it is a motor activity that requires the combination of eye movements, hands and fingers being important for the development of thinking and learning. Visual-motor skills need to be developed in the early grades so that children can achieve successful, legible writing. However, if we do not develop these skills, difficulties will arise such as not respecting the baseline, changing the letters of the words, joining two or more words, separating the words into syllables and not using punctuation marks; hindering the readability and understanding of the text.

The stimulation of visual perception is important because it allows children to develop learning that can be useful in their daily lives. That is why there are some means and resources that we can use, first of all the game as a very powerful means for children to acquire knowledge through their active participation and help the progress of individual capacities through their actions where they intervene mental quickness, creative thinking, perseverance in activity, interest in the task and other forms of positive behaviors. And secondly, the use of ICT as a technological means that can be incorporated into the teaching-learning process, these provide various opportunities for the progress of skills, arousing interest in children.

Intervention programs are preventive proposals with the purpose of providing support to students to avoid various problems that can worsen in later learning. Some of these programs can be used to help overcome deficiencies in visual perception through games and the use of ICT, among them we have: Graphogram (training program through software and speech therapy for the development of the ability to perception and visual motor), Percepfiguras (computerized program for visual stimulation), Multisensory Program (whose purpose is the development of perception through software) and Geogebra (program for algebraic and symbolic calculation through gamification).

This bibliographical review article has allowed a compilation and exhaustive analysis of various articles, doctoral theses and books on the ability of visual perception, where the concepts, difficulties and intervention proposals are explained to address these weaknesses in children early. last 11 years. In the same way, it provides the opportunity for readers to take a look at visual perception as a skill for the acquisition of reading and writing and to be able to take it into account in order to stimulate and develop during the teaching and learning process with the use of teaching resources such as games and technologies. However, this article is an invitation for other researchers to debate and enrich it based on different knowledge, since more innovative works are necessary to achieve a solid foundation on this subject.

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