COURSE FOR
PRE-PRIMARY SCHOOL
TEACHERS

DIDACTIC UNIT 1

WHAT IS THIS COURSE FOR?

Looking out for a School for All

This is the educational material uploaded to VIRTUAL INCLUSIVE EDUCATION and developed by REDTREE MAKING PROJECTS in collaboration with SMALLCODES SRL, ASOCIACIÓN ALBA, ANIRIDIA EUROPE, ANIRIDIA NORGE, and ANIRIDIA ITALIANA within the project “LOOKING OUT FOR A SCHOOL FOR ALL: EARLY EDUCATIONAL INCLUSION FOR STUDENTS WITH LOW VISION”, co-funded by the ERASMUS PLUS PROGRAMME OF THE EUROPEAN UNION.

Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission.
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Co-funded by the
Erasmus+ Programme
of the European Union

COURSE FOR PRE-PRIMARY SCHOOL TEACHERS

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"Never accept that the educational practice should limit itself only to reading words, reading texts, it should include reading context, reading world."

- Paulo Freire

OBJECTIVES OF THE DIDACTIC UNIT

When we finish reading this didactic unit, we will be able to:

- Understand what is the framework and context in which this course takes place.
- Assume which are the main objectives and purpose of the course.
- Understand the educational competences to be developed or reinforced throughout the course.
- Define the focus of the course and its scope for the target group.
- Get to know the proposed methodology.
- Have a greater knowledge of the training contents that comprise the course.
- Have a greater knowledge of the evaluation and certification criteria of the course.
- Identify the European Union (EU) legislative framework in educational matters, and more specifically of the partner countries of the project (Spain, Italy, and Norway).
- Know the differences and similarities in the development of specific measures to address inclusive education for persons with visual impairment, based on the analysis carried out in each of the project partner countries.

INTRODUCTION

The number of severely blind and visually impaired children between 0 and 4 years old is relatively small (approximately 1/3000 babies is born blind or severely visually impaired), but the impact of these first few years of visual impairment is critical to establish their future possibilities of inclusion. While some children come to learn primarily through sight, for example by reading, others on the other

hand, must use hearing and touch to learn, although they can function spatially and use their remaining sight for orientation, and lastly, a small percentage lack useful vision for both mobility and educational purposes. All of the factors above, plus the moment of appearance of the impairment and its evolution, will impact the overall development of the child, requiring different psychopedagogical treatments.

The numerous studies carried out on children who suffer from mild to severe visual impairment have proven that generating care mechanisms as early as possible is essential for them to reach adequate maturity and to achieve full inclusion in their family, school, and social environments, without their visual impairment preventing their development. This early care must begin before the age of 4, and must be aimed towards providing stimuli, according to their corresponding development, and focusing on each case in particular. It must be an enriching and compensatory mechanism, with the true objective of facilitating varied, not improvised situations with specific stimuli that allow a development in various areas: motor, cognitive, social, language, and personal autonomy.

Until now, this specific training for children with blindness or severe visual difficulties was usually carried out in their family environment or in controlled environments for specific training, isolated from other pre-primary schools. However, new studies ("*Inclusion in education: How to make it a reality*" by Foro Educativo, the "*Inclusive Education Manual*" 2006 of the Ministry of Education of Peru, or the Primer "*Let's open the way to the inclusive school*") advocate for the education of visually impaired children along with those with non-impaired vision, by integrating them into ordinary schools. This Integrated Education offers more possibilities for psychosocial development than a segregated one, which would be protectionist. The ultimate goal of this type of education is the social and labor integration of visually impaired children, so they later become individuals capable of participating and interacting normally with the rest of the society, at the same levels of productivity and efficiency.

However, in order to ensure full educational inclusion, we must meet the needs detected in the pre-primary education sector, with tools, materials, and the training of teachers to adapt it to children with visual impairment. Thus, this course aims to offer training for pre-primary education teachers so they acquire the necessary knowledge to promote and facilitate the integration of children with visual impairment in their pre-primary classrooms, especially in the cases of students with the conditions of Albinism or Aniridia.

1.1. OBJECTIVES OF THE COURSE

The course that you are going to start aims to provide basic knowledge on visual impairment, to allow you to develop educational procedures appropriate to the pre-primary education stage, within the general framework of inclusion. Thus, the materials that comprise this course have the following objectives:

- Make an approach to the basic terminology related to low vision.

- Acquire concepts, definitions, and theoretical models on blindness and visual impairment.
- Get to know two genetic conditions linked to low vision: Albinism and Aniridia.
- Understanding theories on the different aspects of visual impairment produced by these conditions and educational inclusion.
- Describe the challenges that arise from visual impairment in the educational context, and know how to tackle them.
- Know the techniques, didactic resources, tiflotechnological aids, and adaptations of materials for students with visual impairment.
- Apply theoretical principles to the analysis and possible actions in a given case.
- Develop a positive attitude towards visual impairment and educational and social inclusion.
- Identify the most appropriate developmental moment for children with low vision to enter pre-primary school.
- Identify the sensory-perceptual limitations derived from visual impairment in the different areas of development, and know the capabilities that low vision child possess, which allow them to achieve a successful development.
- Know and customize the intervention and adaptation guidelines to the special characteristics of development in children with low vision.
- Differentiate the needs and type of care to be carried out, depending on the possible remaining sight and the main impairment, if the child shows is another one in addition to visual.
- Analyze educational ICT resources that promote communication in visually impaired students.
- Select ICT and digital resources that favor the improvement of teaching and learning processes.
- Reflect on the work to be carried out by the school with the families of children with visual impairment and with entities of beneficiaries.
- Understand the importance of visual stimulation to improve the sense of achievement and learning.
- Have a better understanding of what are the educational needs of primary and secondary education students with visual impairment.

1.2. CHARACTERISTICS OF THIS COURSE

1.2.1. EDUCATIONAL COMPETENCES OF THE COURSE

The course you are going to start aims to offer pre-primary school teachers (like you) the possibility of acquiring, updating, completing, or expanding their knowledge and skills regarding attention to diversity, especially in the case of visually impaired students, for their personal and later professional development. We want to offer you the possibility of developing specific training, expanding and renewing your knowledge, and the abilities and skills to turn classrooms into inclusive ones for children with visual disabilities. Thus, this course matches the following teaching competences (TC):

- Knowing how to plan: preparing to teach.
  - TC1: Establish objectives and design learning situations.

  - TC2: Plan the learning progression.
- Knowing how to act: classroom activities.
  - TC3: Manage the classroom.
  - TC4: Address diversity.
  - TC5: Educate in values.
  - TC6: Use new technologies.
- Knowing how to interact: contextualize learning.
  - TC7: Work as a team and participate in the management of the school.
  - TC8: Get to know the school community and environment, involve them and inform them.
- Knowing how to be a teacher and guarantee professional success and well-being.
  - TC9: Manage your own work and make improvement decisions.
  - TC10: Curricular competences; know your own subject.

1.2.2. USERS OF THE COURSE

This course is mainly aimed at teachers of existing pre-primary education schools in Norway, Italy, and Spain, so they can turn their classrooms into inclusive environments for children with visual impairment. Likewise, the guide is designed as guidance in the development of the plan of attention to diversity of schools with students with visual impairment, especially those with the conditions of Albinism or Aniridia.

However, when we speak of the educational community, we must not forget the environment (family, friends), which is why this course also aims to become a valid tool for anyone who intends to enter, in a didactic, scientific, and systematic way, into the appealing and exciting world of the development and inclusive education of visually impaired children.

This is a starting point from which to develop educational care for students with visual impairment with guarantees, but in no case can it be considered as definitive training.

1.2.3. METHODOLOGY OF THE COURSE

The methodology of the course itself is based on virtual training ("eLearning"). This is a recent teaching-learning methodology that facilitates the incorporation of knowledge through the use of interactive online contents, which provides the user with an additional education compatible with their work at school, and adapted to their needs. This course has a 100% online methodology: once you sign up, you will have access to all the teaching materials included in the course for free, so you can download them at any time, and keep them once the course is finished.

This learning methodology is based on advancing along the learning path specified in the Virtual Campus, which consists of a series of topics and exercises, and on evaluating what has been learned through the final tests.

The course will have a schedule in which you can verify your development, and the eLearning platform has its own communication tools like a forum, internal messaging, email, self-evaluation activities, links to upload activities to be evaluated by the tutor of the course, a grade sheet, and access to links of interest like websites, videos, etc.

1.2.4. CONTENTS OF THE COURSE

The course is structured in 10 topics or units, classified by their contents into three blocks:

- Low vision: informative and awareness materials to understand low vision.
- Classroom: training contents and educational resources for teachers.
- School: supporting documents, and technical advice to the staff and the school.

TOPICS

1. TOPIC 1: WHAT IS THIS COURSE FOR?

1.1. Objectives of this course.

1.2. Characteristics of this course.

1.2.1. Educational competences of the course.

1.2.2. Users of the course.

1.2.3. Methodology of the course.

1.2.4. Contents of the course.

1.3. Evaluation and certification of the course.

1.4. Legislative framework in educational matter.

1.4.1. European legislation in educational matter.

1.4.2. Inclusive education in Spain, Italy and Norway.

1.5. Bibliography.

BLOCK 1. TEACHER TRAINING PLAN

2. TOPIC 2: UNDERSTANDING LOW VISION

2.1. Basic concepts and general aspects to have in mind.

2.2. What is low vision?

2.3. Two genetic conditions linked to low vision:

2.3.1. Albinism.

PDF – Characteristics of Albinism.

2.3.2. Aniridia.

PDF – Characteristics of Aniridia.

2.4. The importance of early attention in low vision.

2.4.1. Methodologies for early attention.

2.4.2. At home.

2.4.3. At school.

2.5. Audiovisual materials.

2.6. Bibliography.

3. TOPIC 3: LOW VISION IN THE PRE-PRIMARY CLASSROOM

3.1. Previous acquisitions.
3.2. Orientation and mobility.
3.2.1. Specific recommendations for the teacher and the family.
3.3. Daily life abilities.
3.3.1. Specific recommendations for the teacher and the family.
3.4. Development of students with low vision.
3.4.1. General development.
3.4.2. Perceptive-sensorial development.
3.4,3, Psychomotor development.
3.4.4. Cognitive development.
3.4.5. Affective-emotional development.
3.4.6. Communication, language, and socialization.
3.5. Activities.
3.6. Bibliography.

4. TOPIC 4: NEW TECHNOLOGIES AS A MEANS OF INCLUSION IN THE CLASSROOM

4.1. ICTs and inclusive education.
PDF – Benefits of the inclusion of the students with special educational needs.
4.2. ICTs as an inclusive resource for pre-primary education.
4.3. Digital pedagogies.
4.4. Activities.
4.5. Bibliography.

5. TOPIC 5: DIGITAL METHODOLOGY IN THE INCLUSION OF EARLY CHILDHOOD STUDENTS IN THE CLASSROOM

Guide on the methodological use of the games and the APP in
the classroom

- O2: Educational game

6. TOPIC 6: ACTIONS OF THE EARLY EDUCATION TEACHER REGARDING LOW VISION IN THE CLASSROOM

6.1. Objectives to reach in pre-primary Education.
PDF – Specific basic competences for low vision in pre-primary education; 160 items.
6.2. Recommendations.
6.3. The inclusive classroom.
6.3.1. Educational environments.
6.3.1.1. Educational needs derived from low vision (SEN).
6.3.1.2. The reality of the student with low vision in the classroom.
6.3.2. Inclusive educational community.
6.3.2.1. Guidelines for teachers new to low vision and its characteristics and requirements.

The structure, writing style, and the development of the contents throughout the course are uniform, with each Didactic Unit having a similar structure. They are all preceded by an initial quote and an image, to summarize and illustrate the contents that will follow. Next, the objectives are established, highlighting the importance of the topic to be developed, with an introduction that briefly presents the context of the contents that are going to be addressed. Then, the training contents are developed, always matching your teaching practice, so they can serve as a review, reflection, and ultimately to advance your conceptions and practices on visual impairment within the framework of an inclusive education. This is followed by exercises and self-evaluation activities that allow the user to quickly assess your achievements of the proposed objectives and the knowledge acquired. Lastly, a bibliography is included, with all the bibliographic references made and other complementary ones that are considered significant due to their relationship with the contents, to guide the learning of those users who wish to further delve on the subject.

The writing style of the courses is clear, didactic, and technical, and offers an appealing text combining scientific accuracy, didactics, and friendliness.

1.3. EVALUATION AND CERTIFICATION OF THE COURSE

This course has two complementary evaluation systems:

a) A self-evaluation at the end of each Didactic Unit, carried out by the user, who analyzes the competences he/she has developed, and their ability to adequately solve the included activities. In other words, no one is going to judge you, you evaluate yourself, and have to be honest in doing so to improve your training.

b) A direct evaluation at the end of the course, through a personalized survey matching the chosen content itinerary. To complete this survey, you have to download all the contents of each DU, and finish it in no more than 1 hour.

The direct evaluation will be carried out automatically by the eLearning platform, and its grading will be as follows: Poor (1 to 4), Average (5), Good (6), High (7 or 8), and Outstanding (9 or 10). If necessary, the tutor of the course (a member of REDTREE MAKING PROJECTS) will also highlight the most relevant aspects of the teaching-learning process, the agreements reached, and the decisions taken.

Once the final test of the course has been passed, users will receive a certification for it, via a PDF document sent directly to their personal email. This certificate is endorsed by the project's partner entities, and in the future we hope it to be endorsed by various European public entities.

If the student does not pass the final test, it will show their percentage of wrong answers, plus the DUs to which the failed questions belong. In order to take the test again, the user must wait for at least one week, during which he/she should review the topics related to the questions failed.

1.4. LEGISLATIVE FRAMEWORK IN EDUCATIONAL MATTERS

In order to understand the European legislative framework in educational matters, we must know the context in which we find ourselves. First, note that EU's legal system is basically composed of a primary law, comprised of both the treaties of constitution and those that extended it to new member states, and of a derived law, which is the one formed by the rules of different rank adopted by the community institutions.

Regarding educational policy, three stages can be differentiated, which, although historically unequal, are marked by the periods of validity of the three major Community Treaties: the Treaty of Rome, from the origins of the Community until 1986; the Single European Act, from 1986 to 1992; and the Treaty of the European Union, from 1992. To simplify the evolution analyzed in the different stages with the passage of time, we can see that policies on education have gone from being practically non-existent (in the first decades of EU's history) to having a certain consideration in more recent times. However, it is still clear that -at least for the moment- member states do not intend to achieve a convergence of the educational model, as is the case with the model in economic matters.

Although it is difficult to standardize a European model, simply because such a model does not exist, we can harmonize the models of the different countries, at least regarding their matching and compatibility.

Looking into the future, it seems clear that the implications that education has in all spheres of social life, especially in the world of labor, make it impossible to move towards a European unity while leaving the educational field on the sideline. Thus, the contribution of education to the community

construction of Europe is key, and will increase in importance, not only because of the previous considerations, but also due to the ability to forge a European identity. This is reflected in the quote by Jean Monnet, the true architect of community construction:
"*If I had to start over, I would start with education and culture*".

1.4.1. EUROPEAN LEGISLATION REGARDING INCLUSIVE EDUCATION

Considering now inclusive education in this context in Europe, education has been solidified over time as a basic right that reflects the principles of equity, quality, inclusion, equal access, permanence, promotion, selection, and social participation that are prevalent in our society. Historically, starting from segregationist, differentiating, and sometimes exclusive models, we see how all countries have progressively turned towards newer, fairer, egalitarian, and inclusive educational models, as a reflection of new social models.

If we analyze the historical evolution of inclusive education in Europe, we can see that the changes that occurred since the 1950s can, in a very synthetic and general way, be divided into 4 major stages:

- In the 1950s, European countries began to undertake policies to fight illiteracy and grant the right to education for all students, with civil society playing a leading role.
- In the 60-70s, popular movements demanding a fairer society and social integration gained great strength, originating a series of far-reaching political and social changes that also impacted educational integration.
- In the 90s, citizen movements for a higher quality education and more resources and public aid became generalized and intensified. The term *inclusive education* began to be used in this context.
- It is from the year 2000 onwards when, in more socially advanced countries of northern Europe: Norway, Sweden, Finland, and Denmark (among others), effective measures were put in place to promote inclusion in the classroom, equal opportunities, and respect for differences. This trend spread slowly to the remaining countries of central and southern Europe.

Some other important steps that have been taken in recent years in the different educational systems of European countries are:

- The conversion of specific schools into resource schools, as a key factor to have enough support and reinforcement to achieve the integration of students with special educational needs (SEN).
- The increasing importance given to the specific training of professionals, gradually considering them an essential factor for a truly successful integration and inclusion.
- The real participation and involvement of families throughout the educational process of their children.
- Cooperation and collaboration between the different professionals and services that participate and collaborate in the education of students with SEN: psycho-pedagogues, pedagogues, speech therapists, teachers, special education professionals, etc.

Many organizational and educational factors of the inclusive school seem obvious from a theoretical point of view, but they imply changes in the very essence of the educational system, which means modifying ideas and approaches that, having been used for decades, seem immovable. A very clear example is the curricular and evaluative adaptations, still too rigid in most countries and insufficiently adapted to each student. This represents a major obstacle to achieving the full deployment of inclusive education at all levels.

"The principle of inclusive education consists in adapting the learning processes to each individual, allowing to achieve the maximum performance of each person with different characteristics and capabilities; therefore, this opposes segregating the students with disabilities in special education centers. Inclusive education implies an active effort in favor of social cohesion and integration, an effort that usually translates into significant investments in teacher training, support teachers, facilities, and materials".[1]

The United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2006), signed by the EU as such, and ratified by practically all its member states, explicitly supports inclusive education. This commitment was recently renewed in 2015, at the World Education Forum through the Declaration of Incheon (Korea).

Lastly, some of the existing international tools for inclusive education are:

- 1990 UNESCO Jomtien Conference (Thailand), in which reference was made to inequalities in the fulfillment of the right to education.
- 1994 UNESCO World Conference on Special Educational Needs: access and quality, Salamanca (Spain). The first steps for the development of an educational system including inclusive education were taken.
- 2000 UNESCO World Forum on Education in Dakar (Senegal). It renewed the commitment to education for all, and inclusion and equity in education as a cornerstone for it, examining the impact of technology on education.
- 2006 UN Convention on the Rights of Persons with Disabilities. In its article 24.1, it recognized the right of persons with disabilities to education. To make this right effective, without discrimination, and on the basis of equal opportunities, the state parties shall ensure an inclusive education system at all levels.
- 2015 World Education Forum, Declaration of Incheón (Korea). In it, the commitment acquired with education for all and educational inclusion was renewed, stating among other objectives: "To guarantee an inclusive, equitable, and high quality education, and to promote lifelong learning opportunities for all".

[1] Quality factors of inclusive education in Europe: an exploration; Study promoted by the European Network for Inclusive Education and Disability, incluD-ed, promoted by ONCE, within the framework of the Operational Program 2007-2013 (ongoing until December 2015) co-financed by the EU Social Fund.

1.4.2. INCLUSIVE EDUCATION IN ITALY, NORWAY, AND SPAIN

Regarding Italy, Norway, and Spain, the educational policies in each of them guarantee the inclusion of all students in ordinary centers, providing specific support (materials, staff, methodological adaptations etc.) for each student who needs it. The introduction of these specific supports is justified by developing a specific intervention plan for the student with specific needs for educational support, like those with Albinism or Aniridia.

The development of the intervention plan, which may have different names depending on the country, is a direct responsibility of the school, who will draft it with the advice of specialized professionals and resources for each need. The different support systems can consist of materials: providing them to the school and its students (lecterns, specific educational resources, technological materials: camera systems for the classroom, digital screens, digital tablets, digital bibliographic materials, etc.). This can be complemented with the total or partial presence in the classroom of a specialized teacher who will work coordinately with the staff included in the intervention plan, their support focusing on the direct support of teachers. What is not included in the plan, unless specified, is the adaptation of the objectives and contents of the curriculum -understood a reduction-, the adaptation must follow the principles of accessibility, flexibility, and inclusiveness.

The training of professionals is essential and is coupled with continuous training; this can be done through the competent bodies in the field of education, collaboration between professionals from different schools, and with external institutions specialized in visual impairment. In most of these countries, specialized resource centers and support services have been created; in our case we have analyzed those dedicated to visual impairment, to which ordinary centers ask for guidance in the design of the specialized intervention plan for students, to search for material or personal resources, and for pedagogical support and coordination. Coordinated teamwork is essential to ensure a high quality education adapted to the special needs shown by students with Albinism or Aniridia.

The financing of all these resources comes mostly from the countries' central governments, in some cases also with financing from regional and local entities (individual regions and towns, etc.), or sometimes a combination of central and local funding. In cases in which financing is decentralized (fully or partially), access to existing resources is greater, but it may cause a different treatment depending on which local administration manages it, despite the fact that the Central Administration has defined identical objectives.

Lastly, based on the analysis mentioned at the beginning of the chapter on inclusive education in the partner countries, we have collected in a poster the most interesting context data for each of the countries, among which we can observe: percentage of students signed up in pre-primary schools, the number schools and proportion between public and private, teachers-students ratio, the percentage of students with visual impairment, the level of integration of these students in ordinary schools, etc.

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Looking out for a School for All

COURSE FOR
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DIDACTIC UNIT 2

UNDERSTANDING LOW VISION

Looking out for a School for All

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Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission.
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Co-funded by the
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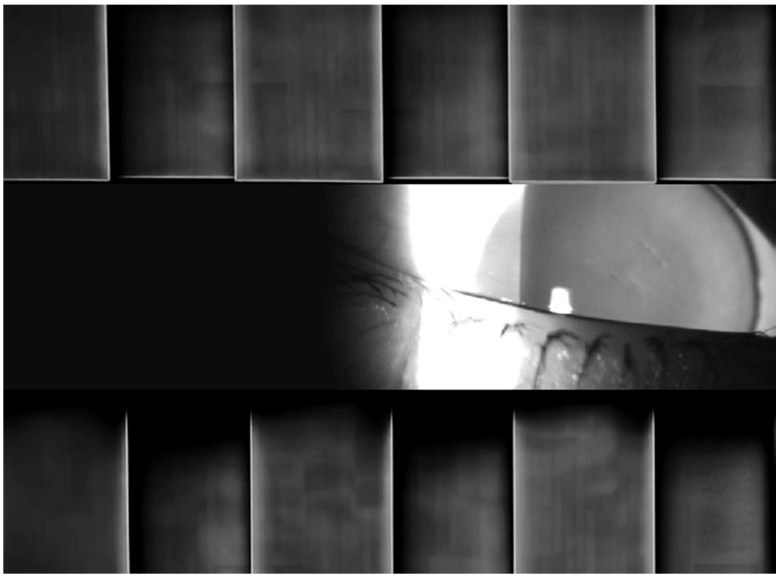

Not everything is black or white.

There is a vast range of grey tones between these two colors…

Well, it is the same for sight,

not everything is seeing or blindness.

OBJECTIVES OF THE DIDACTIC UNIT

At the end of reading this didactic unit, you will:

- Acquire basic notions about the bases of the physiology of vision.
- Delve into the foundations of low vision.
- Understand the different types of causes that originate it, knowing the specific cases of Aniridia and Albinism.
- Understand why poor visual function can be treated after an early and adequate diagnosis.
- Adapt the intervention guidelines in early care to the peculiar characteristics of the development in children.
- Reflect on the work to be done with parents of children with low vision in the field of early care.
- Differentiate the needs and the type of care to be carried out, depending on the possible remaining sight.
- Identify the most suitable developmental time for children with low vision to join nursery school.

INTRODUCTION

The best way in which we can cement our knowledge on how to educate children with visual impairment is to know and understand why they have an altered visual function. In this chapter, we will go into the optical anomalies of the visual system that children frequently show, from the bases of ophthalmological knowledge, emphasizing those in persons with Aniridia and persons with Albinism.

We will present the analysis of the concept and classification of the different degrees of visual impairment and the criteria for its evaluation, and we will approach the basic concepts of some eye

Co-funded by the Erasmus+ Programme of the European Union

diseases, focusing on the specific development of the case studies: Albinism and Aniridia. We believe that after their assimilation we will be in a better position to approach with a more solid pedagogical base to understand children with low vision produced by these conditions, evaluate them effectively, and adequately satisfy the special and ordinary educational needs of these students.

We will next pay special attention to the care of children with remaining sight; we will study the specific needs they show and how to act with it, analyzing some general models of intervention in early care. We will also analyze the work to be done with the parents of the visually impaired baby, due to the importance it has for their proper development.

Lastly, we will indicate some criteria to take into account when incorporating children with low vision into nursery school.

2.1 BASIC AND GENERAL CONCEPTS TO HAVE IN MIND

In order to understand the low vision situation that nursery school students can show, we have to start by knowing how vision works. That is, what allows us to see things, people, or landscapes; what depends on our eyes or what depends on the environment.

Our visual system is made of three inseparable parts: the eyes and their auxiliary organs, the optic nerve, and the visual center in the cerebral cortex. Vision only works when these three parts work together; if any of the three does not work, visual perception is altered, therefore, a person with any injury, alteration, or simply a lack of development in any of the elements of the visual system will have difficulties and a poor functioning of his visual system.

The parameters that determine a good visual function are: visual acuity, color sense, light direction, field of view, contrast, and the refraction or accommodation of the lens to focus. All this without forgetting that vision is a human capability that is exercised intelligently, meaning that our previous experiences, both visual and other kinds, intervene for a correct interpretation of reality.

The functional state of the eye can be established based on the functional repercussions caused by the alterations in visual acuity and in the visual field, although this is not a comprehensive assessment of all aspects of vision. Visual acuity allows us to perceive and distinguish the details of objects at short and long distances, meaning that a good acuity allows us to appreciate the small details in images, and a low acuity allows us to see just large features or those with the highest contrast. Visual acuity is assessed with *optotypes*, which are given values in percentages or decimals; thus, acuity of 10/10 is considered perfect vision (100%), with 0/10 being absolute blindness (0%), so the different degrees of acuity fall between these values. Depending on the evolution of the pathology or genetic condition that causes the malfunction of vision, we will have a functional remainder up to very low levels of this parameter. To give some examples, persons with Albinism have decreased visual acuity from 20/60 to 20/400, and persons with Aniridia usually have an acuity of less than 20%, depending on the alterations associated with each case.

It is important to keep in mind that the vision of children does not stop developing until they are three or four years old. However, in the case of children with Aniridia we know that they are born with a specific remaining and their daily life is adapted to it, so children adapt to their environment with their own resources. Although the remaining sight of a child with Aniridia is very small, it does not mean that it is going to deteriorate, improve, or that it's going to continue the same throughout its life. This remaining sight, as it is caused by Aniridia, is potentially compromised by the possible alterations that may arise over the years (cataracts, glaucoma, corneal degeneration, dry eye…). It is in the hands of children and his environment to follow the instructions of professionals and comply with the treatments indicated in each case if these alterations occur. The greater care and attention, the greater guarantee the child will have for quality of life and preserving the remaining sight with which he/she was born.

On the other hand, the visual field is the space that the eyes cover without making any movement when looking straight ahead; it is measured in degrees, and is an oval in each eye, limited by the nose and eyebrows. It measures from the fixing upwards about 60º, downwards about 70º, 60º inwards and 100º outwards. The evaluation is carried out by means of a *campimetry*. Visual field loss can be peripheral, central, or in upper, lower, or lateral hemi-fields mainly, although there are more irregular forms in pathologies such as diabetic retinopathy.

Thus, we can conclude that organic or anatomical abnormalities of the eye and/or the optic pathway (of the visual system) will condition defects in visual function and, in extreme degrees, their total absence. In the first cases we will talk about **visual deficiency**, and of **blindness** in the total absence of visual function.

For the sake of further understanding, certain basic aspects of blindness and visual impairment need to be considered. First, we should mention that we all have an incomplete vision at birth, which progresses rapidly in the first weeks of life as the intercellular connections or synapses between the retina, the optic pathway, and the cerebral cortex develop. In the development of these synapses (established by the neuronal dendrites), adequate stimulation of the sensitive elements and the integrity of the transmission path is required; if a synapse does not act as a transmission bridge, the amount of substances necessary to transfer the information decreases, and normal development does not occur. Visual function is required for intercellular contacts to mature normally, so an inadequate development on the one hand, and pathological processes that affect the eyes, their protective elements, or the pathways of connection with the brain and cortical centers on the other, cause situations of loss of visual function that place us in the field of blindness or visual impairment.

Considering the different levels of blindness, they have been differentiated from absence of light perception to legal blindness, going through situations of visual disorders with limited residual function in which the concept of low vision or visual deficiency is used. Blindness is usually understood as deprivation of visual sensation or sense of sight. Ophthalmologically, blindness should be interpreted as the total absence of vision, including lack of light perception. In practice, we consider blind persons as those who have functional residual vision within limits that are quantifiable in normative tables, which forces us to reconsider the term "legal blindness". This concept includes the situation of people who have a visual functional impairment that prevents them from having a visual acuity greater than

the limit of 1/10 or a visual field greater than 10 degrees. This reference has been taken for the limitations that arise in these situations of poor visual function for the recognition of objects from the outside world in the case of poor visual acuity, and to have safe spatial mobility in the event of visual field deterioration. The consideration of legal blindness is of interest for determining the degree of disability or handicap of a person, to establish specific pensions or aids.

In ophthalmology, we consider that a person is fully blind or *amaurotic* when they are totally deprived of vision, so they are not capable of having a visual sensation, not even with high intensity light sources. The term amaurosises is also applicable to a single eye, when the sensory anomaly only affects one eye; the blind eye that does not perceive light is called *amaurotic*. An eye is *amblyopic* when it suffers from functional limitation without apparent organic damage to the eye; this is the well-known "lazy eye", and its most frequent causes are strabismus and asymmetric refractive defects. In these cases, *amblyopia* occurs only affecting one of the eyes, and it is called *monocular amblyopia*. There are situations such as congenital *nystagmus* that affects both eyes and causes *binocular amblyopia*.

Lastly, the functional category of visually impaired person also includes people who suffer a deterioration of visual function with persistence of a remaining vision superior to the one defined in "legal blindness", but which puts difficulties on tasks that are easy for persons with normal vision. We should also remember that difficulty for carrying out daily life activities increases proportionally to the loss of vision, multiplying the problem if there is an alteration of both the visual field and visual acuity.

2.2 WHAT IS LOW VISION?

Low vision is the visual condition that a person suffers when they have a significant reduction in their vision which does not improve with the use of glasses, contact lenses, or successful pharmacological treatments like surgery, and therefore suffers from difficulty or inability to do some daily life tasks. There are many causes for low vision, mostly eye diseases (Macular Degeneration, Glaucoma, Diabetic Retinopathy, Retinitis Pigmentosa, Myopia Magna…), but also accidents, neurological injuries, genetic conditions, congenital malformations, infectious diseases, etc. Therefore, there isn't one unique way of seeing with low vision, but many symptoms that produce it (blurred vision, patched vision, glare, night blindness, tunnel vision, loss of contrast, alteration in the vision of colors…).

According to the World Health Organization (WHO), people considered with low vision fall between the limits of a maximum of 0.3 (30%) and a minimum of 0.1 (10%) of visual acuity and/or a visual field between 30 and 10 degrees. Situations in which visual acuity is equal to or less than 0.1 (10%) and the visual field is equal to or less than 10 degrees are called "legal blindness" in Spain. Despite this all, it is important to highlight that low vision in the educational context is associated with the terms "partially blind" and "legally blind" to describe the severity of the visual impairment.

Sometimes detecting or understanding that a student has low vision is very difficult; **it is much easier to put oneself in the place of a blind person than in the place of a person with low vision**, because: how and how much do they actually see? This is very complicated since there is no established

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standard on how and how much people with low vision actually see, since each individual sees differently depending on their degree of visual impairment. Not all children with low vision have the same visual acuity, not everyone manifests the same symptoms, nor do they do it with the same intensity; thus they need constant medical surveillance to assess their visual function.

According to studies by *Retina Plus Foundation* and the *Spanish Low Vision Society*, the population with low vision in Spain exceeds one million persons. These analyses also expose that there are around two million persons with acute visual limitations, and due to the increase in life expectancy in the Spanish population, the prognosis is that there will be more and more people at these levels of visual dysfunction, limiting their daily activities.

However, in our society in general, there is the idea that a person either sees or does not see. Mid-term situations -of partial blindness, low vision, or other visual disabilities- are not well understood, so there is no social awareness of the existence of Low Vision. And this idea does not only not exist in people, but also even in normative situations, remaining in a limbo that makes equitable care of Low Vision very complicated, especially in public services.

In order to better understand low vision, you can access these videos:

- https://youtu.be/mftfLBivCco
- https://youtu.be/s9dZ20pw2ZM
- https://www.youtube.com/watch?v=3qfIltp26pQ&list=PLF07Ybkp5CUJSFazP16gobr6YxjHD80On&index=3
- https://cuv.upc.edu/es/servicios/unidades-de-especializacion/unidad-de-baja-vision-y-poblaciones-especiales/videos-sobre-baja-vision

2.3 TWO GENETIC DISORDERS LINKED TO LOW VISION

2.3.1 ALBINISM

The term **Albinism** comes From the Latin word *Albus*, meaning white, and it refers to the condition resulting from the genetic condition that results in a deficiency in the production and distribution of melanin in our body. Melanin is a pigment found in most of our body, which is a very efficient photoprotector due to its chemical properties, since it allows to dissipate into heat more than 99.9% of the sun radiation absorbed. In humans, melanin is found in the skin, the hair, the pigmented epithelium that surrounds the retina, the spinal cord, the reticular area of the adrenal gland, some areas of the inner ear, and some others of the brain. The concentration of this pigment in persons with Albinism is significantly lower.

From the words of Dr. Lluís Montoliu[1] in his book "*What is Albinism*?" we can state that "there is not one type of Albinism but many, which do not share the same symptoms, nor do they show them with

[1] Lluís Montoliu has a PhD in Biology and is a researcher in CSIC, in the department of Molecular and Cellular Biology of *Centro Nacional de Biotecnología* (CNB-CSIC) in Madrid, and an expert in Albinism and rare diseases.

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the same intensity or relevance". The only shared characteristic is specifically visual impairment to some degree, while the lack of pigment in different parts of the body may or may not appear depending on the person's genetics and their type of Albinism.

There are two main types of Albinism depending on the affected areas, these being:

- *Oculocutaneous Albinism* (OCA), affecting the pigments of the skin, hair, and eyes.
- *Ocular Albinism* (OA), in which the eyes are affected by the decrease or absence of melanin.

It is necessary to note, if we want to know the origin of Albinism, that persons with this condition are born with it: they do not "become" or "get" Albinism, so it is important to refer to it as a genetic condition and not as "a disease that can be cured". Albinism is the result of a genetic mutation, the genes responsible being recessive, so an abnormal copy of the responsible gene must be inherited from both parents for it to manifest; two defective copies of the gene are necessary.

Thus, in terms of prevalence, Albinism is a recessive genetic condition, and since only one of the two copies of each gene is inherited from each parent, the probability that they appear in the same person is small: specifically a 25% (1/4 children) if both parents carry the gene.

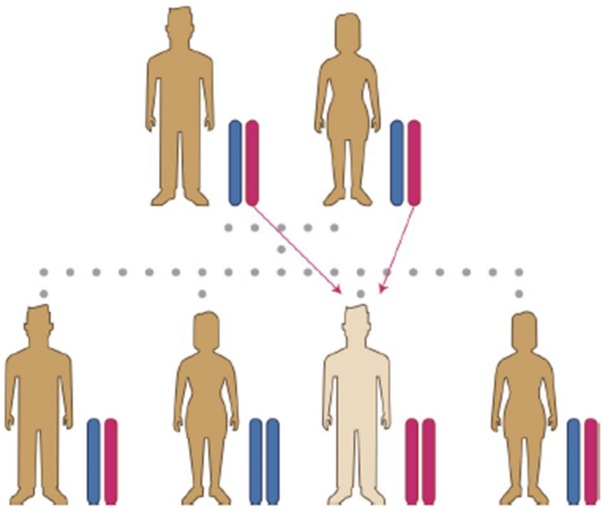


Figure 1: hereditary pattern of Albinism.

Therefore, even if the two parents are carriers of the gene, it is much more likely (75%, ¾ children) that the child will be born *without* Albinism than *with* it; but and even if the child does not develop Albinism, he/she will be twice as likely to have inherited one copy of the gene from one of the parents than to have inherited both "healthy" copies of it.

This makes it a rare genetic condition: approximately only 1 in 17000 persons have some type of Albinism (recent studies estimates this at around 1 in 10000 people). From these numbers, we can deduct that in Spain, with approximately 46 million persons, there are approximately 3000 people with some type of Albinism; in Italy, with approximately 60 million, there are around 6000 persons; and in Norway, with 5 million, around 500 persons.

To better understand Albinism, you can download the following PDF (**characteristics of Albinism**), visit the website of ALBA, Asociación de Ayuda a las Personas con Albinismo (Association to Aid Persons with Albinism) www.Albinismo.es, and access the following videos:

Lo ves? – Full short film on how a person with Albinism actually sees.

- https://www.youtube.com/watch?v=kguIMobfDJc

Rompiendo mitos del Albinismo / Breaking Myths About Albinism – ALBA Documentary

- https://www.youtube.com/watch?v=dHojY5GhyHQ

PDF – CHARACTERISTICS OF ALBINISM

Albinism is a recessive genetic condition that is globally characterized by:

a) Alterations in sight (decreased visual acuity).
b) Absence or a decrease in pigmentation (melanin) in the skin, eyes, or hair.

Due to the genetic diversity of the human population, there is not one single type of Albinism, but two types with numerous subtypes, so not every person with Albinism shows the same symptoms or with equal intensity or relevance. The only characteristic shared by all types of Albinism is a reduced visual acuity, while the lack or reduction of pigment in different parts of the body may or may not appear, depending on the person and the type of Albinism.

As we explained before, Albinism can be OCA or OA, and each of them can have variations according to the affected gene, giving rise to the different subtypes identified.

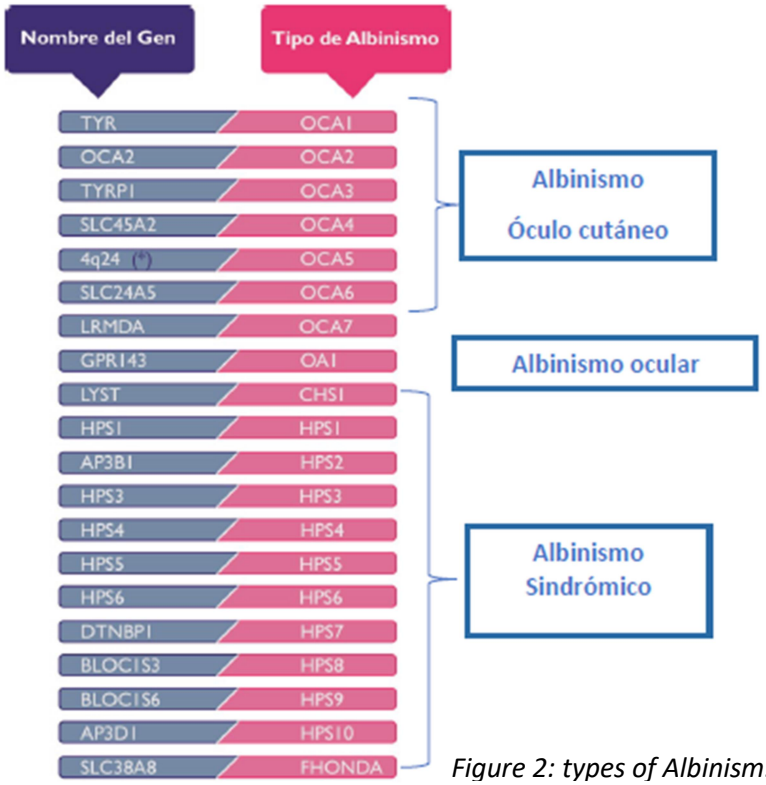


Figure 2: types of Albinism.

OCA or *Oculocutaneous* Albinism:

Persons affected by OCA show effects both in their skin and eyes; there are numerous subtypes, depending on where the genetic alteration is found, and they are:

1. OCA1: the most frequent kind in western populations (America and Europe), caused by mutations or alterations in the *tyrosinase* gene. It has two subtypes, A and B:
   - OCA1 A mutations on the *tyrosinase* gene almost fully disable the gene function and therefore interrupt pigment production.
   - OCA1 B mutations on the *tyrosinase* gene do not fully disable the function of the gene, which allows the synthesis of limited amounts of pigment.
2. OCA2: the most frequent type of Albinism in black persons.
3. OCA3: linked to mutations or alterations in the gene for *tyrosinase* type 1 (TYRP1), another of the enzymes that make up melanin synthesis.
4. OCA4: mutations or alterations of the SLC45A2 gene; it seems to be the most frequent type of Albinism in Japan.
5. OCA5: the mutated gene is unknown at the time; it has been found in a family of Pakistan.
6. OCA6: involves the SLC24A5 gene, and has been observed in persons of Chinese origin, but also in Europeans.
7. OCA7: involves the C10orf11 gene; identified in Danish families and from the Faroe island.

Syndrome-type Albinism:

1. Hernansky-Pudlak syndrome (HPS): in addition to the characteristics of oculocutaneous Albinism, persons affected by it show circulatory, respiratory, and digestive problems. It is usually localized in Puerto Rico and very rare in the rest of the population.
2. Chediak-Higashi syndrome (CHS): persons affected by it show symptoms similar to those of HPS, including serious immune system issues, making them very susceptible to infection. It is associated with mutations in the LYST gene.

OA or *Ocular* Albinism:

Persons affected by OA only show effects in their eyes, and involves the GPR143 gene. The amount of pigment that can be synthesized and the age from which it accumulates can vary widely.

A new type of Albinism, FHONDA, was recently identified, first described in 2013 in patients from families of Turkish, Indian, and Pakistani origin, and identified in 2014. It is associated with mutations in the SLC38A8 gene, and its name is the acronym for the alterations it shows: Foveal Hypoplasia (FH), deficiency in optical nerve crossing (ON), and alterations in the anterior segment (DA); all of them except the alterations in the anterior segment are present in usual cases of Albinism.

Regarding the prevalence of the different types and subtypes of Albinism, it is not identical in all cases. For example, OCA1 is the most frequent, with a frequency of around 1 in 40000 persons; which would mean that in Spain -for example- there would be around 1200 persons with OCA1.

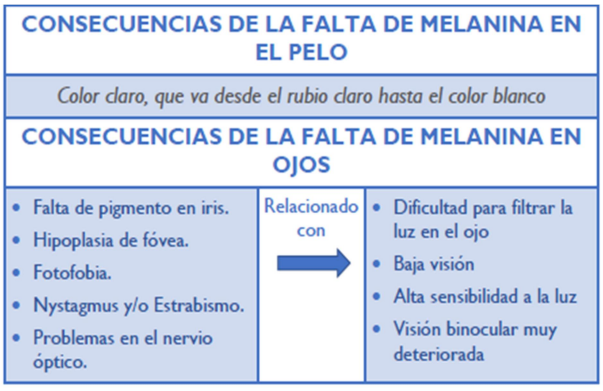
Although Albinism affects all human ethnicities, there are some types of Albinism (like OCA2) that are especially frequent in persons with origins in sub-Saharan Africa. Among them, approximately 1 in 10000 persons show OCA2, while this frequency decreases to around 1 in 36000 people in the rest of the world (meaning approximately 1200 persons in Spain).

For all the aforementioned, and as ALBA states "Albinism is classified as a low prevalence pathology, or 'rare disease' -epidemiologically speaking- since it affects less than 1 of every 2000 persons".

Consequences of Albinism:

The direct consequence of the different mutations related to Albinism is a decrease or the total absence of melanin, the pigment distributed throughout the body giving color and protection to the skin, hair, and eyes. As the body shows difficulty producing or distributing it, it produces the most characteristic symptom of Albinism: *hypopigmentation*.

Melanin is synthesized after a series of enzymatic reactions (a metabolic pathway) by which the transformation of the mentioned aminoacid into melanin occurs by the action of the enzyme *tyrosinase*. Persons with Albinism have this metabolic pathway interrupted since their *tyrosinase* has none or very little activity (insufficient), so the transformation does not occur, and they do not have pigmentation. Melanin is used to protect our skin from the sun's UV rays, and for our eyes to properly develop the retina.



2.3.2. WHAT IS ANIRIDIA?

Aniridia is a genetic, congenital alteration. While the word "Aniridia" literally means "lack of iris", it is actually a disorder involving various eye structures are involved, and is generally bilateral and incomplete, since in most cases there is an incipient –underdeveloped- iris. This is caused by a lack of development of the eyeball during pregnancy, due to a genetic mutation on pair 13 of chromosome 11, which affects the PAX6 gene responsible for the formation of the eye and other structures, which is why it is sometimes linked to malformations in other organs of the body.

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The first symptom detected is photophobia, but also the lack of development of the retina and the optic nerve, which causes low visual acuity, usually of 20% or less. Persons with Aniridia may also have other eye disorders:

- Nystagmus: constant and involuntary movements of the eye.
- Glaucoma: high intraocular pressure that can permanently damage the optic nerve.
- Cataracts: opacity of the lens.
- Keratopathy: alterations of the cornea, due to a deficiency of limbal stem cells.

Aniridia can be isolation or as part of a syndrome, the most frequent being WAGR syndrome (Wilms tumor, Aniridia, genitourinary disorders, and mental retardation). There is no cure for Aniridia, although some associated disorders and complications can be treated, so patients require frequent ophthalmological and general check-ups and controls.

To better understand Aniridia you can download the following PDF (**characteristics of Aniridia**), visit the web: https://www.Aniridia.eu/, and access the following video:

Aniridia. Congenital Aniridia as a PAX6 syndrome.

➢ https://www.youtube.com/watch?v=pBgAwak01GQ

PDF – CHARACTERISTICS OF ANIRIDIA

Aniridia (from the Greek “without” [an-] and “iris” [-iridia]) is a rare disorder that mainly affects the eyes, but depending on the severity and type of the condition, it can also have other implications in health and its development. In most cases, it is caused by mutations in the PAX6 gene, and is inherited in approximately 2/3 cases. Aniridia is registered in Orphanet, the reference information portal for rare diseases and orphan drugs, under number ORPHA77.

Besides the lack of this tissue (iris hypoplasia), Aniridia also shows alterations in other structures of the eye: cornea, lens, optic nerve, and retina. The center of the retina -which provides the most precise vision (fovea)- and the optic nerve are frequently not very developed (hypoplasia/dysplasia), causing changes in the normal visual development in newborns, and later a lack of a good visual acuity. Therefore, most persons with Aniridia have an innate visual impairment with the typical signal of nystagmus (involuntary oscillatory movement of the eye present in all diseases that lead to congenital visual impairment).

During life, the eyes of persons with Aniridia can develop complications, the most frequent being opacification of the lens, opacification of the cornea, cataracts, and high ocular pressure with damage to the optic nerve (glaucoma), which can all lead to impaired visual acuity.

Like Albinism, Aniridia is a genetic condition, since it is present at birth; it is diagnosed by clinical examination and confirmed with genetic tests. Aniridia is not always detected in routine pediatric examinations at birth, but in the first or second week of life. Parents should be aware of the following signs on their newborn child:

- Reluctance to opening eyes and crying in bright light.

- More willingness to open them in dim light.
- Uncontrollable movements of the eye.
- Difficulty in focusing the eyes, not smiling.
- A lack of coloring in the iris (black eyes like a wide pupil).

At any of these signs, parents should seek a medical examination of the infant by an ophthalmologist. The doctor will conduct the following tests to confirm Aniridia and assess the severity of the congenital disorder:

Examining eye movement:
- Nystagmus. Are there uncontrollable eye movements as a sign of visual impairment?
- Can the child focus his sight?

Examining the anterior segment of the eyes with a magnifying lens or microscope:
- Degree of Aniridia (partial or full)?
- Is the lens transparent or are there cataracts?
- Is the cornea transparent?

Examining the back of the eye with a magnifying glass and light:
- Does the child have foveal hypoplasia?
- Is there hypoplasia in the optic nerve?

Measuring eye pressure:
- Is eye pressure normal or high? (this test should be conducted at least every six months throughout the life of a person with Aniridia!).
- In a newborn or young child, it may be necessary to measure eye pressure under general anesthesia.

If Aniridia is diagnosed by an ophthalmologist, the child should undergo genetic testing to find out which genetic mutation has led to Aniridia, and check for linked syndromes such as WAGR Syndrome. As for the inheritance and frequency of Aniridia, it affects from 1 in 40000 to 1 in 100000 persons, and affects equally men and women. Aniridia is inherited from an affected parent in a 50% chance (family Aniridia), and about 1/3 cases come from what we call “de novo mutation”, meaning that the child develops a new mutation, parents not having it.

Aniridia is transmitted in an *autosomal dominant* way. Dominant meaning that only one mutated *allele* is needed to produce it (allele is each of the two copies of every gene we have in every cell of our bodies). Since only one allele is transmitted from each parent to children, the affected person can transmit the mutation to an average of 50% of their children, regardless of their sex. The most frequent genetic conditions in Aniridia (geneticists call them “mutation”) are defects in the PAX6 gene.

Genes -on chromosomes- are where all of our developmental and hereditary information is stored; each human being has 23 pairs of chromosomes, which store hundreds of thousands of genes. They are important for the development of all parts of the embryo's body during pregnancy, and are responsible for human development and organ functions throughout life. The PAX6 gene is located on the short arm of chromosome 11 (11p13) and regulates eye development from weeks 8 to 14 of pregnancy – so Aniridia develops at such an early stage that no mother of an affected child has to worry about having done something wrong during pregnancy. This gene regulates the development of the whole eye, which is why the alteration in its function leads to panoramic abnormalities (of the whole eye), which not just affect the iris, but also the cornea, the anterior chamber, the lens, the retina, and the optic nerve. Besides being responsible for the development of the eye, the PAX6 gene is also responsible for the development of other parts of the body, such as the kidneys, pancreas, brain, and other areas currently being studied.

Thus, mutations in PAX6 may also be linked to diabetes and a tendency to gain weight in persons with Aniridia, but although most cases of Aniridia are caused by mutations in PAX6, in some cases no mutations in this gene have been identified.

WAGR SYNDROME

WAGR Syndrome is a rare syndrome associated with Aniridia; WAGR stands for: Wilms' Tumor (pediatric kidney tumor), Aniridia, genitourinary abnormalities, and mental retardation. It happens to 10% of persons with Aniridia (never in family Aniridia), and it is caused by other genes on chromosome 11 not working, along with PAX6. For more information: http://www.wagr.org/.

Despite its rarity, all children with Aniridia should undergo ultrasound examinations to detect the possible tumor in time until the genetic diagnosis ruling out WAGR syndrome is obtained.

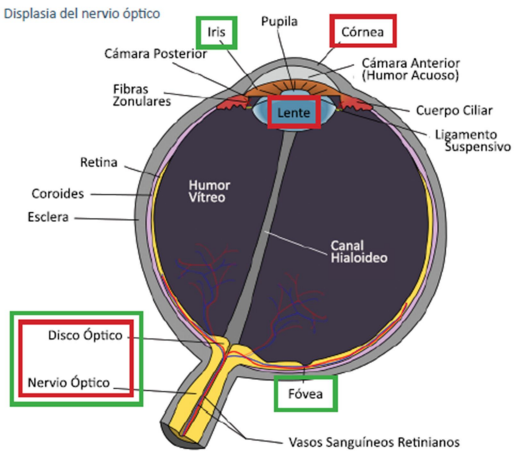
Genetic testing is done by sending blood samples from the affected person and their parents to specialized laboratories. There, the genetic tests focus on the PAX6 gene and its contiguous genes, responsible for WAGR Syndrome. Test results can take from weeks to three months, and will show the type of genetic condition and confirm or deny WAGR Syndrome.

THE EYE WITH ANIRIDIA

The eye is a delicate organ with many layers that "translate" the optic signal into electrical signals that the brain can understand. We see with our brain, but it takes all the microscopic parts of the eye to transmit the image to the optic nerve.

Eye disorders present at birth that are more specific to persons with Aniridia include:

- Iris hypoplasia.
- Fovea hypoplasia.



- Dysplasia of the optic nerve.

POSSIBLE FUTURE ANOMALIES

Later other complications -marked in red in the figure- may appear:

- Corneal opacity
- Waterfall
- Glaucoma with damage to the optic nerve

The diagram shows that the tissues that help the optic nerve pass the optical signal through the eye (cornea, iris, lens) and the tissues that translate the optical signal into electrical impulses and send it to the brain (fovea , optic nerve) are those affected in Aniridia.

2.4 THE IMPORTANCE OF EARLY CARE IN LOW VISION

Early care can be defined as a set of actions that provide children with the experiences they need to develop their potential to the maximum; the term is relatively recent and has a meaning equivalent to others that have fallen into disuse, like “early stimulation” or “early intervention”.

Initially, early care programs were aimed at children with high environmental risk, subject to the unfavorable influence of the environment by belonging to marginalized sectors of the population, and also to those others with probable biological risk factors (premature children, low weight…) or with an established deficit (cerebral palsy, Down syndrome, blindness…).

The main emphasis of early care was initially on treatment aimed exclusively at children, so it consisted of an organized enrichment program designed to provide appropriate activities for children at risk or with disabilities, whose development might be affected by various causes. Thus, most programs were aimed at teaching new skills to children, which in the first months focused on sensory-motor training. However, the new theoretical contributions that support the practical application of early care programs highlight other aspects such as: family adjustment, family social support, designing the physical environment of the home, the aspects related to child health etc. **Consequently, the treatment cannot be directed only at children; the actions must be aimed at them, their family, and their community too**. This means that the classical-rehabilitative model is therefore abandoned to adopt a new psycho-pedagogical one, in which the child is treated as a global unit, with difficulties and potential, always in interaction with the environment. The treatment will have a multidisciplinary approach, highlighting the work to be done with parents, both at the guidance and support level, to better interact with their child. In this context, support for their integration in school will be included, at the time most appropriate.

Child development is a highly complex and dynamic process based in biological, psychological, and social evolution. The first years of life constitute a particularly critical stage of existence since the perceptual, motor, cognitive, linguistic, and social skills that will allow a balanced interaction with the

surrounding world are going to be configured in it. In the case of children with low vision (many of them with Albinism or Aniridia), due to their sensory limitations, it is vital to help them develop.

In the next Didactic Unit, we will study the potentials and limitations that low vision imposes on babies for their development, looking at when, where, and why we must intervene.

2.4.1 WHAT IS EARLY CARE?

According to the white book on early care[2], and as we pointed out at the beginning of this section, early care is understood as: "The set of interventions aimed at children of 0-6 years old, their family, and their environment, aimed at answering early to the transitory or permanent needs of children with developmental disorders or at risk of suffering them. These interventions, which must include all aspects of the child, must be planned by a team of professionals with an interdisciplinary or transdisciplinary orientation".

During the first years of life, children with low vision are more dependent on the initiatives of their parents and adults close to them; a child without visual impairment receives a lot of information from his environment and accesses many experiences spontaneously without them having been intentionally programmed, but children with low vision do so in comparative terms, they depend more on adults to provide them.

2.4.2 BASIC ASPECTS FOR THE EARLY CARE OF CHILDREN WITH LOW VISION

It is important to provide children with low vision with opportunities for experimentation, to bring them closer to elements of the environment that would otherwise be excluded from their perceptual field, and help them integrate and interpret coherently the stimuli they receive from the outside. Fostering access to a richer and more interesting experience world will help the cognitive and maturational development of children with low vision. But providing a rich environment does not mean to subject children to a continuous or accelerated rhythm of stimulation or activity; providing stimuli is as important as preserving them: activity is as important as tranquility.

In any case, children do not learn passively according to what adults want to teach them, they make successive achievements based on their needs and desires from a very young age. Our responsibility as adults is precisely to stimulate these desires, give them opportunities to learn, and present them with assimilable information, which is only possible from a positive interaction in a calm and comfortable climate, and from a deep respect for children and their particular characteristics.

The evolutionary development of a child with Albinism or Aniridia is not the same, and will vary depending on their visual limitations. Their lack of vision will impact their psychosocial development

[2] State Federation of Associations of Professionals in Early Care (GAT), Spain's Ministry of Work and Social Affairs, documents 55/2005, http://www.juntadeandalucia.es/salud/servicios/contenidos/andaluciaessalud/doc/LibroBlancoAtenci¦nTempranа.pdf

due to the problems that lack such an important meaning for the knowledge of the outside world, limiting their ability to control the environment around them and their relationships with it.

2.4.3 CONSEQUENCES OF LOW VISION IN CHILDREN FROM 0 TO 6 YEARS OLD

The very important limitations to which children with low vision are subject (especially between 0 and 6 years old), not only in the amount of information they receive but in the way they do it, must be considered in the educational intervention that will try to complement and organize it. These difficulties can sometimes cause:

- A great passiveness due to the lack of stimuli that must be compensated by teachers, developing their motor and spatial capabilities to the maximum, and helping them in the mental representation of objects and the space that surrounds them. Educators must give verbal information to accompany their sensory experiences, explaining what and how they are seeing or touching.
- A tendency to not focusing and hyperactivity may appear due to their perception difficulties. Children find it difficult to understand what they see, finding things that mean nothing; they lose focus and go from one to another, looking for something that motivates them.

The need of children with visual impairments for adults to show them things and teach them how to know and interpret them causes them to be dependent longer than average. Adults' intervention will be based on support, enabling the development of the autonomy of the visually impaired child. Their low vision will also influences their psychomotor development; first they are usually more passive and inactive, preferring the security that their known space provides, and usually gesture less.

They can be intelligent and constant people, but with thoughts much more linked to what is directly perceived, more concrete thinking with less capabilities for abstract and hypothetical thinking. Language, therefore, will be a very important role for a child with Albinism or Aniridia, since they will use it to know and learn to mentally manipulate the reality that surrounds them. In this sense, we must be very aware, since they learn to use verbalisms, or words without fully knowing their meaning. Sometimes we assume that they know a word because they use it regularly, but they can doubt its meaning when they are asked.

Regarding their affective and social development, they are usually shy or insecure, which is an aspect that must be worked on from school to promote integration and avoid future low self-esteem, bad mood, sensitivity to frustration, etc. Within health, a disability is any restriction or absence (due to a deficiency) of the ability to carry out an activity in the way or within the range that is considered normal for a human being. According to the International Classification of Functioning, Disability, and Health (ICF), there are 9 broad domains of functioning that may be affected by a disability:

- Learning and application of knowledge.
- General tasks and demands.
- Communication.
- Mobility.

- Self-care.
- Domestic life.
- Interpersonal interactions and relationships.
- Main areas of life.
- Community, civic, and social life.

Fully developing these 9 broad domains is very difficult, perhaps it is that all of us, whatever we lack, have a disability, when it comes to taking care of ourselves, our food, our health… who hasn't had relationship problems? Who has never felt different? To achieve this broad development and alleviate that lack of ability to do things as the WHO tells us, we must work and develop emotions and feelings, be inclusive in our actions and in our words, so people with sensory difficulties can fully develop, we will help develop their emotions and this will affect their future life and emotional intelligence.

Children with sensory problems will show many difficulties in understanding and managing their emotions in their childhood, and as they grow up, in developing their thinking and relationship with the environment if he does not work with them, the acceptance of their difficulties and how to face them. Probably if we do not do it, they will be insecure, shy, and with low self-esteem in the future, so they must be helped to understand that *limitation* is mainly a word, not an impossible barrier to overcome, that *normality* is a relative term that is sometimes coupled by ignorance, and that they will be able to do whatever they want in life if they set their mind to it, even if it takes them longer.

2.4.4 PROBLEMS IN EARLY CARE

Until a while ago, there was a proliferation of early care programs, not supported by a theory to guide their practice, doctors prescribed treatments to alleviate the deficit. This was usually achieved through the acquisition of certain skills by children, producing situations of anxiety and stress if not achieved, and in many cases feelings of guilt on the parents.

Overcoming this previous model has led to new ones, aimed at working with the family and the environment of the child, or focused on parent-child interaction processes, benefitting from the positive aspects of family, since they offer information, support, and advice. This implies the need to develop programs in which, in addition to children, the family situation is considered, since there are usually needs that must be remedied before parents can be involved in the educational process. As *M.J. Guralnick* and *D. Bricker* state, doctors should avoid becoming "experts" to tell parents what to do and how to do it; it is better to develop a cooperative relationship in which each individual provides valuable information and skills.

Since we are not going to copy a specific early care program in this didactic unit, there are "guides" with objectives and activities, that allow to follow the achievements that children reach in the different areas sequentially: perceptual-cognitive, motor, handling, socio-communicative, and autonomous habits. However, when developing an early care program, some items should be considered:

- Following the child's initiative: their motivation to learn derives from their success in trying to influence their physical and social environment.
- Allowing the child to choose between different possibilities: showing preferences is an important aspect of developing a sense of control over the environment, and is an important base for communication, often making them want or reject things.
- The consequences are important: when a desirable or interesting action is the result of something the child does, they will be more likely to continue or repeat the behavior.
- Making consequences effective:
  - Naturally occurring consequences are most effective in teaching children that they can influence their environment.
  - Social consequences (expressions of enthusiasm, caresses…) must be used with caution, especially so that it is possible to support the child when they have to learn to do difficult tasks in which natural consequences can be little appreciated or achieved only with great effort.
  - Social consequences are a natural result of teaching communication skills.
  - The same consequences are not effective for all children.
  - It is important to change effective positive consequences often to avoid boredom.
  - The consequence must be immediate.
  - The consequence must always occur.
  - When they begin to understand spoken language, verbal explanations of the consequences increase their effectiveness.
- Dividing a task into several parts when necessary: this can be a change of materials and/or teaching the different parts separately.
- Providing continuity and change: continuity gives them a sense of security; within this safe world, it is possible for children to recognize the changes and be interested in causing them.
- "Preparing" for success: the activity must be a challenge, not an impossibility.
- Incorporating educational experiences into daily routines: there are good reasons to believe that the experiences that constitute a part of the daily routine teach more effectively than those that constitute, in isolation, a specific educational activity.
- Giving children time to rest: adults can teach children a lot, simply by showing sensitivity and enthusiasm for their interests.

2.4.5 METHODOLOGIES FOR EARLY CARE

Lastly, regarding the methodology, the most widely used in the application of early care programs is the one based on behavioral techniques. However, this is today subject to review and criticism, since the possibility that children develop strategies for solving problems is questioned, due to the fact of trying to provoke a specific response to a specific problem posed by the adult in conditions rigorously controlled and structured.

This also means a high degree of stress for the parents in many cases, since the programs focus on achieving the child's predetermined responses (taking out, putting in, doing a puzzle, walking, scribbling…). This does not mean that the principles of behavioral learning are no longer valid in the

application of early care programs, but it must always be combined with the child's daily activities. We must distinguish between the objective to be achieved at a certain time and/or a certain area and the activities to be carried out to achieve it. The latter must be adapted to the daily routines and interaction games typical of parents and babies. The characteristics and needs of children must be considered, and the natural environment in which they operate must be respected.

Regarding the environment in which children have to function, one must take care to ensure that these are sensorially rich and varied, which does not mean invasive and chaotic. The ability to explore new objects and situations that favor both cognitive and socio-communicative development should be fostered, so games must always be inserted in a stimulation program so that many of these objectives can be worked on through them: object permanence, handling skills, vestibular development, communication, symbolic development, etc.

There is still a need in the area of early care for visually impaired children to continue delving into the peculiarities of their development, however we know that this is not only looking at the development of the potential of children, but rather the objectives of the program should include how to make the environment around them and the interaction with their family more accessible.

2.4.6 EARLY CARE AT HOME

As well as it is important to respect the feelings and desires of children when we work with them, it is no less important to attend to the state of mind of their parents; any help and guidance is only effective if it is given in a timely manner. Parents have suffered when receiving news that their child will have difficulties and their visual problem will sometimes limit their learning at a different pace from that of their peers. Family is very important, they are the first to face a situation that can sometimes be unknown, and their reaction is vital for the development of their children. Fear and asking oneself a thousand questions -that are at first very difficult to solve- do not help to face the new situation; the family goes through difficult times, sometimes without the necessary strategies to face them, since it is a situation that they never experienced.

When a child is born, all the expectations as parents are placed in him: what they would like them to do, how we would like him to be, even want them to do those things that parents are or were not able to do, that they never suffer… Parents do not realize that all this is superficial, in many cases a chimera; what is really important is that the child becomes a person, with all the connotations of the word, regardless of whether they have limitations or not. Parents sometimes many choose the easiest, least complicated option, denying the problem or enlarging it, but both are wrong ways for the harmonious and integral development of a child. Thinking that nothing can be done, denying reality, and increasing the barriers to mistakenly protect a child are often the cause of parents who are excessively protective or who do not assimilate the pathologies of their children. But we must not fall into criticism, many pathologies are unknown to the population, many of them have a very low prevalence, which is why they are considered rare diseases, and if parents have not received good advice, they will also not know what is happening, and the worst thing for a parent is not knowing what will happen to their child.

Uninformed parents will think that they do what is best for their child, but they will take longer to accept situations, accept their child, and if their actions continue without anyone explaining them that they are mistaken, the child will not be able to accept or believe in themselves. Sometimes parents, with the intent to help, raise barriers that are difficult to break, inadvertently transmit their fears, forgetting to rejoice when limitations are overcome.

Forgetting that their children have a limitation is something that happens frequently with the passage of time and living day by day, but paradoxically sometimes parents become vindictive so that the prejudices of others are overcome to achieve what their children are entitled to. Sometimes they go through situations where they are forced to convince everyone that their child is capable of things, but this will not be enough for them to do so. Some other times they insist on risking their child's health with impossible therapies, possible chimeras yet to be discovered, just because they don't accept their condition. But we should not judge them, everything goes through a period of acceptance, and they do it thinking about the good of their children.

Parents suffer because of how their child interact with others, forgetting that everyone needs time to assimilate the condition of visual impairment. Childhood and adolescence are the periods in which parents suffer the most, we must help them understand that this will serve their children as training to face the harsh competition in life and learn to answer to difficulties, but having their support and encouragement, never compassion.

Carmen Herrera, with Albinism, an elite athlete, triple Olympic medalist, sad in a newspaper article: "With a visual acuity compromised regarding to what is considered standard, persons with low vision can do almost anything, while many people who consider themselves 'normal', would feel as useless with only a remaining vision. Prejudices hinder understanding, you have to throw them away because they do not let us see beyond, and sift how beautiful and extraordinary this world is, making it sad and grayish, exactly the mediocre world that is suited for mediocre persons".

As you see, many times is us who fall into the category of "normal", those who emphasize differences, and who have in our hands, with our daily work, the possibility of changing this.

2.4.7 EARLY CARE IN SCHOOL

All this work in early care would not be complete if we did not facilitate, at the appropriate time, the child's incorporation into a broader social life than what's offered by the family nucleus and their therapist. It is necessary to show society to them, so they know its rules and meet its demands. This function of inserting children in society is done via the School, which in turn has the mission of preparing them for their future commitment to it. As in any student, the home-school relationship is very important, but in these cases it is essential, since parents are an impressive source of information, after all, they live with their children every day and know first-hand the difficulties of their child and what to do so they achieve the challenges we propose. It is our job to turn all this information into tools and guidelines for our workplace: the educational environment.

Sometimes, as teachers, we believe that we know everything about education, but day-to-day with children teaches us that this is not the case, that children teach us something new every day, and being able to count on people who know what is happening to a specific student, what things can be done pedagogically, and which have already been tried and do not work, even encourages you in your educational work, helps us in our work with these students.

Based on this, we know that the insertion process must be prepared jointly with the parents. In this sense, it is necessary to do work sessions with them, in which they are helped to think about questions such as: what does this first separation mean for the family? what fantasies does the school create in their mind? what expectations, fears, and degree of trust in other people do parents have? what kind of school is planned, and is it suitable for children and their current possibilities? do they establish a more or less adequate mental separation from the moment school is introduced? etc.

With sufficient notice, a first contact will be made with the chosen school and the advantages and disadvantages that it poses for the visually impaired child will be considered. If the school is deemed appropriate, a meeting will be called with all interested professionals, and information about the visual impairment and its repercussions on development will be offered, followed by a discussion of the specific child who is to be integrated: what he/she is like, their abilities, difficulties, anxieties and fears, conditions to have in mind, and all those aspects that can help teachers and educators in their task and understanding of children. It is important that the whole school shares the integrative educational project, and that children, as a consequence, participate in the general school dynamic.

The incorporation into school should be progressive, beginning this difficult stage for children and the parents, whenever possible, and the relationship between the two is appropriate, with someone familiar to child. Gradually, the person who will perform the functions of “auxiliary” will disappear, and this role will be filled by their direct educator at the nursery school, thus beginning the learning to share it with other children. It is recommended not to overload the school schedule so children can make this adaptation in a rational and understandable way.

At the same time, the right conditions should be created so that parents feel supported and “accompanied”, and to be able to offer them the opportunity to express and share their feelings and doubts with the early care specialist. At the beginning of school, all parents experience feelings of anxiety and doubts; when the child has a disability, these fears multiply, and the separation is much more painful, also having permanent elements of comparison, and the verification of the limitations and difficulties of the child. On the other hand, the integration process should be welcomed with enthusiasm by the school, accepting and understanding the specificity of children with low vision, respecting their right to be different, and favoring the structural and organizational changes deemed appropriate. And there are many questions that also produce insecurity or anxiety in the teacher.

Therefore, given the new feelings and expectations generated by the incorporation of children with visual deficit into a class, it is interesting that the specialist can hold interviews with the teacher and, where appropriate, with other agents of the educational community as soon as possible, with the purpose of exchanging points of view and allow talking about all those aspects that concern them.

Lastly, it is convenient to hold regular meetings with teachers from the schools or nurseries that participate in the integration, offering a common space to contrast opinions, knowledge of experiences by other professionals; a joint reflection that ultimately stimulates and favors these natural processes, but which are both difficult and complex. Once some of the theoretical and practical principles to be considered before incorporating the child into the nursery school are presented, like creating adaptative bridges prior to integration and the methodology of professional intervention in this process, it is necessary to highlight that not only the needs of children are important, but also the experiences of the family and the needs raised by educators in these early stages of adaptation.

2.4.8 CRITERIA TO DECIDE WHEN TO INCORPORATE A CHILD WITH LOW VISION INTO PRE-PRIMARY SCHOOL

To close with this second didactic unit, we will indicate below the main criteria that must be taken into account when deciding when to incorporate children with low vision into school, **which must be before the age of 6, to develop social skills during early learning processes**, these criteria are as follows:

1. "Having achieved ambulation and some handling development: as a consequence of the visual deficit, the child's psychomotor development may be affected. This is largely due to a lack of motivation, as there is nothing in the outside world that invites to look and subsequently want to achieve.
2. Being able to make demands through language, and therefore, to be able to speak: it is the shape that is truly distinctive of objects, shapes that, just as sight does, touch can also perceive. The universe of touch only encompasses the extension of the arms, so it is impossible for all the objects of life to enter this space to perceive, let alone establish the spatial relationships that exist between them.

   The help of language is necessary for its value of representation, as many studies indicate, which also acts as an organizer of thought. It is notorious that -thanks to language- blind or low vision people can achieve most of the knowledge, which should not be confused with visual experiences. With the appearance of language, the child will begin to make the first "spatial maps".
3. Having achieved the permanence of an affective object: for the blind child, the mother is a principle, the only clear reference of the outside world. A rupture of the bond with the mother, prematurely, will put the child in tremendous anguish and deep fear, which will prevent them from further progressing in their development as a person".

2.5. AUDIOVISUAL MATERIALS

¿Lo ves? | Full short film: how a person with Albinism sees.

- https://www.youtube.com/watch?v=kguIMobfDJc

Rompiendo mitos del Albinismo | BreakingMythsaboutAlbinism – ALBA Documentary

- https://www.youtube.com/watch?v=dHojY5GhyHQ

Aniridia. Congenital Aniridia as a PAX6 syndrome.

- https://www.youtube.com/watch?v=pBgAwak01GQ

The range of low vision.

- https://www.youtube.com/watch?v=3qfIltp26pQ&list=PLF07Ybkp5CUJSFazP16gobr6YxjHD80On&index=3

The following is a series of videos that show diverse daily situations of persons with low vision.

- https://cuv.upc.edu/es/servicios/unidades-de-especializacion/unidad-de-baja-vision-y-poblaciones-especiales/videos-sobre-baja-vision

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Looking out for a School for All

COURSE FOR
PRE-PRIMARY SCHOOL
TEACHERS

DIDACTIC UNIT 3

LOW VISION IN THE PRE-PRIMARY CLASSROOM

Looking out for a School for All

This is the educational material uploaded to VIRTUAL INCLUSIVE EDUCATION and developed by REDTREE MAKING PROJECTS in collaboration with SMALLCODES SRL, ASOCIACIÓN ALBA, ANIRIDIA EUROPE, ANIRIDIA NORGE, and ANIRIDIA ITALIANA within the project “LOOKING OUT FOR A SCHOOL FOR ALL: EARLY EDUCATIONAL INCLUSION FOR STUDENTS WITH LOW VISION”, co-funded by the ERASMUS PLUS PROGRAMME OF THE EUROPEAN UNION.

Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission.
This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the
Erasmus+ Programme
of the European Union

COURSE FOR PRE-PRIMARY SCHOOL TEACHERS

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"What we see changes what we know; what we know changes what we see."

- Jean Piaget

OBJECTIVES OF THE DIDACTIC UNIT

By the end of this chapter, you will:

- Know the objectives of the teaching of orientation and mobility and the skills of daily life for the development of personal autonomy.
- Know the sensory system and its main implications in the overall development of children.
- Know the sensory-perceptual limitations derived from the visual deficiency in the different stages of development.
- Identify the perceptual, tactile, and auditory sensory competences of children with severe visual impairment.
- Identify the psychomotor, cognitive, and affective-emotional competences of children with severe visual impairment.
- Identify the specific adaptive processes carried out by children with low vision to access the world of knowledge.
- Recognize the critical "mediation" of adults in the achievement of significant and experiential knowledge by children with low vision.

INTRODUCTION

In order to understand the sensory-perceptual, psychomotor, cognitive, and affective-emotional capabilities and limitations of children with visual impairment, it is essential to briefly address the process by which all children experience and interact with the world. This process, known as "growth and development" is both similar in all children and unique for each child. It is similar, in that there are identifiable stages that all children go through; and it is unique because the rate of progression differs for each of them.

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This principle is also applicable to children with low vision derived from Albinism or Aniridia, whose growth and development is usually more similar than different from that of sighted children, although it is true that visual limitation imposes such significant inter-individual differences that homogenization is difficult. In any case, it can be stated that persons with severe visual conditions share a peculiarity that has relevant effects on their behavior, their way of adapting to the environment, and their way of growing and developing in the world.

Variations, therefore, should generally be attributed to the direct or indirect influence of the visual impairment. The relationship between it and maturation is significant[1] for many authors, since it influences the relationship and communication of children with their environment by limiting their participation and access to information, and therefore the development of language, the appearance of symbolic play, and other variables of development. Indirect influences are those that occur in the environment in which children live and that can deprive them of certain opportunities and experiences, due to mistaken attitudes and lack of knowledge regarding the nature of the visual impairment.

Taking the importance that the entire sensory-perceptual system has in development process as a starting point, this chapter explains how this process is carried out in children who have limitations in a priority perceptual resource for humans: sight. Likewise, the differences that the deficit produces in the psychological development of children will be analyzed to guide the establishment of adequate intervention and education guidelines that optimize their learning.

Methodologically, development has been divided into different sections; it is unnecessary to clarify that children do not progress in isolation in each of these theoretical references, but rather that their evolution is a global evolution where all their capabilities act synchronously.

3.1 PREVIOUS KNOWLEDGE

Throughout this guide we have continued to convey the importance that vision plays in learning the skills related to the personal autonomy of all people; many of our more or less automatic behaviors have been progressively incorporated into our behavioral repertoires on the basis of maturation level. Children with visual problems start from an unfavorable situation when acquiring habits related to their personal autonomy: the difficulty for natural observation of models of other children or adults, due to the partial loss of vision that persons with Albinism or Aniridia suffer entails obstacles in processing, storing, and retrieving useful information.

What specific objectives do we want them to achieve?

FROM 0 TO 3 YEARS

- Progressively acquire autonomy in habitual activities.
- Develop affective capabilities.

[1] VV.AA (2000), "Aspectos evolutivos y educativos de la deficiencia visual", Madrid, ONCE.

- Gradually obtain hygiene, health, food, and rest habits.
- Interact with others and gradually acquire basic guidelines for coexistence and social relationships.
- Develop communication skills in different languages and forms of expression.

FROM 3 TO 6 YEARS

- Move around the classroom, school, and playground.
- Locate school equipment.
- Use the facilities (dining room, toilets, corridors, etc.).
- Participate in all activities (sports, recess, etc.).
- Develop self-confidence and responsibility.
- Participate in social and family activities.
- Self-care tasks (food, personal hygiene, etc.).
- Collaborate on household chores.
- Form valid and functional concepts.

There are two aspects related to personal autonomy that have great relevance in their development, enhanced with the lower the visual efficiency of the student is: Orientation and Mobility, and Daily Life Skills, both related to psychomotor development.

Coarse and fine psychomotor development in students with visual disabilities are important to achieve independent and safe mobility and control their environment while developing a good self-concept. Regard to coarse psychomotricity -which involves the use of long muscles- we are especially interested in posture control, since abnormal postures of the head related to nystagmus are frequent to improve their view. A multidisciplinary intervention on posture control, rhythm, balance, and coordination, laterality is necessary in the first cycle of basic education, guaranteeing good psychomotor development, personal autonomy and therefore positive self-esteem. Regarding fine psychomotricity, it is necessary to develop grasping skills, coordination, independence between fingers and hands, and handling skills like cutting with scissors and knife, tying shoelaces, clasps, buttons, drawing…

3.2 ORIENTATION AND MOBILITY

Orientation and mobility are always linked and are the same aspect of those related to personal autonomy that must be paid great attention, which is why it should be considered a specific objective to be included in the corresponding adaptation. This adaptation can be found developed in greater depth in didactic units 6 and 7, actions by teachers and nurseries for low vision in the classroom. However, orientation involves understanding the environment, which is becoming aware of the person's spatial situation and the ability to interact spatially with the elements of the environment.

The objective is for students to move safely, efficiently, and autonomously in their familiar or school environment, both known and unknown, and to have the necessary skills to carry out daily activities in their environment. This is achieved thanks to information from the senses (hearing, touching, seeing…) and the development of spatial and environmental concepts. Mobility, or the ability to move independently, safely, and effectively, involves learning protective techniques (for indoors and

outdoors) and other techniques that allow the visually impaired child to walk in a straight line, follow references, move around the school, classrooms, the street, etc.

Lastly, we must bear in mind that spatial orientation is going to be more difficult for visually impaired students because hearing and touch are not enough to interpret this type of information. Not having all the spatial information impacts their mobility and orientation, their independence, and their relationship with the environment, impacting their personal autonomy, so they can show feelings and behaviors of insecurity, fear, impotence, anxiety, sometimes passivity and blocking, or sometimes in a lesser search for exploratory behaviors and social interaction that will lead to less personal autonomy.

Children with severe visual impairment move less, or in a less organized way, tending to use less space to play than children without visual impairment, since it is important for everyone to have control of space and security when playing, this control is diminished if they have visual impairment.

FROM 0 TO 3 YEARS[2]

Regarding this area of orientation and mobility, at the end of the first cycle of pre-primary education, children should be able to:

- Establish the idea of point of reference.
- Use systematic search models with their hands.
- Use points of reference and clues.
- Experiment with different ways of getting around (sitting, standing with support, and lastly independently).
- Move intentionally.

FROM 3 TO 6 YEARS

Regarding this area of orientation and mobility, at the end of the second cycle of pre-primary education, children should be able to:

- Moving around their home and of other family or friends that they visit frequently.
- Recognize references in the usual outdoor strolls.
- Move around the classroom and be able to make the most frequent trips to other facilities (toilet, dining room, or schoolyard) without help.

3.2.1 SPECIFIC RECOMMENDATIONS FOR TEACHERS AND FAMILY

- To guide children, *hold their hand* and walk slightly ahead of them. Adults usually go inside places (buildings and public transport) “giving way”, but the best way to guide is enter before them, putting your arm back to place the child behind.

[2] Regarding the chronological organization and by areas of the objectives included in this and the following sections, we base on the data included in published development scales for children with visual impairment or with disabilities with references to this population, in some calendars on the general development of children, and in the data collected by ONCE, ALBA, and Aniridia Europe over their years of experience. Although we know that this may be useful as a reference for the development of your children/students, it is not intended to become a requirement, nor supply the support that professionals can provide.

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- When outside, the adult should inform and make them notice the different urban elements and significant perceptible stimuli that may be useful in their later autonomous movements: traffic sounds, directions, street size, texture of the pavement, traffic lights…
- Give them small responsibilities: to tell you when they reach the crosswalk, decide when to cross, or locate significant places, like home, the school, the bakery, etc.

3.3 DAILY LIFE ABILITES

We will include here all those activities and skills needed to carry out daily tasks of personal care, home care, and social and communication activities through the use of techniques for interaction with the environment in a safe, independent, and effective way, which favors the independence and autonomy of children.

Parents usually take care of these aspects of their child's life, due to their inability to fend for themselves at very young ages, but we know that to develop orientation-mobility and daily life skills for students with visual disabilities related to Albinism or Aniridia, we must act in coordination with all the elements of their network of support (school-parents-friends) by designing individual intervention considering their personal characteristics and needs. Furthermore, a disability or difficulty in autonomy at an early age does not mean that it will be permanent and absolute; parents often delay the child's development by not promoting their autonomy and personal independence, either because they do not know how to teach them or because they tend to be overprotective. It is necessary to intervene as soon as possible in this area and show the children's environment the need to stimulate their independence. Being autonomous means having the necessary skills for certain tasks, especially daily life ones, but also believing in oneself, knowing that they are capable of doing something without the help of others. In this sense:

FROM 0 TO 3 YEARS

Regarding this area of daily life skills, at the end of the first cycle of pre-primary education, children should be able to:

- If they like a food item, to take it and eat it.
- Eat tablespoons by themselves, with hardly any food falling.
- Eat some solid food without help.
- Recognize some clothing items.
- Potty training (daytime).
- Help to set the table with simple objects one by one.

FROM 3 TO 6 YEARS

Regarding this area of daily life skills, at the end of the second cycle of pre-primary education, children should be able to:

- Eat solid food without help.
- Open the fridge or closet and take what they want. If they make a mistake, correct it.
- Recognize the clothes they wear.

- Know many everyday objects, their function and use (for example the comb and trying to comb their hair, the toothbrush to brush their teeth…).
- To properly use the WC.
- Dress and undress by themselves with simple clothes.

In conclusion, some of the objectives to be achieved during the early education stage (6 years) are having acquired the following skills[3]:

- Grooming: using the WC, washing and drying their hands, brushing their teeth, and bathing with some help.
- Food: pouring tap water and drinking by themselves, using the fork with easy foods and the spoon for puree, using a napkin.
- Personal grooming: dressing and undressing in simple clothes, putting on their coat.
- At home: picking up toys, helping set and remove the table.
- Social skills: identifying themselves (name, age…).
- Order and method: (example) placing their coat on its coat rack (marked tactile or visually) and pick up the materials used in the classroom, when appropriate.

3.3.1 SPECIFIC RECOMMENDATIONS FOR TEACHERS AND FAMILY

Children should take their baby bottle with their hands, they should be allowed to touch the baby food and then put their hands in their mouth, etc., and lastly start eating with cutlery. They should learn to drink by holding the glass with their hands, eat the same things as other family members when possible, etc.

Around the half of the second year it is convenient to sit children on the potty so that they begin potty training, first in short periods of time, and with patience. Being able to sit on the potty means that at least this milestone of motor development has been achieved; likewise, children must know where the bathroom is, etc. They have to explore the bathroom, while telling them the name of its elements. It is necessary to reinforce the fact of peeing or pooping in the right place, and remember that poop is generally easier to control than pee.

For dressing and grooming, children should start gradually, by allowing them to take off their clothes (a good time them to explore the different items while we describe them and teach their names) and then gradually teach them how to put it back on, always going from simplest to hardest.

Regarding hygiene (hand washing, toothbrushing, etc.), proceed step by step, with caution so that the child does not confuse the tasks. For example, it is convenient to initially have the child's hands between yours when washing them, for example. You have to trust that little by little they will do these tasks as a routine, but do not give up just because they are difficult or they make mistakes at first.

[3] VV.AA. (2011): "Discapacidad visual y autonomía personal. Enfoque práctico de la rehabilitación", ONCE, Dirección de Autonomía Personal, Madrid. Pág. 661-692.

All of this is about training students with severe visual disabilities to be autonomous, safely and effectively, and consequently, is necessary to acquire basic skills related to fine and coarse motor skills, conceptual and perceptual development etc. (explained in following sections) to carry out these tasks. Visually impaired children must learn to trust themselves as soon as possible, and this can only be achieved if the people around them support and encourage them have their own responsibilities; the degree of autonomy is necessarily linked to the growth process.

To finish with these two sections, and before giving way to the different areas of development for students with visual impairment, we must point out that orientation-mobility programs and daily life skills must be carried out individually, adapted to the characteristics and needs of each student, considering the individual factors that may impact the learning process. Likewise, it is necessary to promote adequate empathy between the teacher and their student, establish a long habituation period, plan the training, provide adequate feedback on progress, etc.

Consequently, some of the recommendations to consider in the program for the acquisition and development of orientation-mobility and daily life skills for students with visual disabilities through individualized intervention, are:

- Evaluation of the remaining sight and to what extent it is usable for their training and subsequent mobility.
- Evaluation of mobility capabilities and spatial knowledge.
- Designing the individualized intervention plan with interdisciplinary participation.
- Analyzing the tasks to be taught and their sequence, depending on the student's needs, starting from the simplest to the most complex.
- Avoiding overprotection of the student, allowing them to expose themselves to situations in which they have to implement autonomy strategies.
- This, along with the use of positive reinforcements by educators and parents, will favor the development of feelings of security and confidence, and consequently of self-efficiency and self-esteem.

3.4 DEVELOPMENT IN STUDENTS WITH VISUAL IMPAIRMENT

When addressing the intervention with students with visual disabilities derived from Albinism or Aniridia, it is necessary to bear in mind some basic aspects of development and the consequences that these genetic conditions may have. In this section we will try to answer these questions and delve into certain aspects of the development of persons with visual disabilities, the importance of the sensory-perceptual system in development and how it evolves, and how educational intervention should be like.

Lastly, it is worth mentioning that development has been methodologically divided into different subsections, although it is unnecessary to clarify that children do not progress in isolation in each of these theoretical references, but their evolution is global process where all their abilities act synchronously.

3.4.1 GENERAL DEVELOPMENT

There is often the generalized idea regarding children with visual disabilities, that when their visual capability is diminished, they significantly develop the rest of their senses, but this shas not been contrasted to date. What is a fact is that general development, as it is highly dependent on the sensory-perceptual system, may show differences when compared to normovisual children, an aspect that must be very present in classroom care.

This development is similar to normovisual children, they go through the same stages, but do it differently; the difficulty is reflected in the rate of acquisition. From birth, babies relate vision to the movements of their hands, quickly learning to hold objects and find them when they fall; as they age, they use a greater distance to find and observe objects, but in the case of blindness and low vision this possibility is very reduced, taking time to relate objects to sounds.

The environment of children with severe visual impairment can be difficult and inaccessible at times, which can generate fear and insecurity that lead to less motivation to move, reducing the number and variety of learning experiences. Adding that if parents have an overprotective education, it can have consequences on their self-esteem and autonomy, and mean a future social withdrawal and a decrease in their participation in social interactions with their peers.

In summary, severe visual impairment can have various effects on the development of children, their balance, and well-being. The relationship between it and maturation is significant for many authors, since it influences the relationship and communication of children with their environment by limiting their participation and access to information, and therefore the development of language, the appearance of symbolic play, and other variables of development.

3.4.2 PERCEPTIVE-SENSORIAL DEVELOPMENT

We perceive the information of our environment through our senses, interpreting it through our attention, emotions, and our memory, and organizing it intelligently to give a coherent interpretation. Children with visual disabilities receive visual stimuli in a diminished and different way, so they make the most of the rest of sensory information, and it may seem that their hearing, taste, kinesthetic, and tactile acuity is greater.

Babies are born with surprising abilities: they follow moving objects, distinguish smells, and even make trans-modal transfers of sensory channels (Stern, 1991). An example of these capabilities is shown in the experiment by Meltzoff and Borton (1979): Three-week-old babies were blindfolded and given one of two different types of pacifiers to suck (one spherical and the other bulging). Well, when the pacifier and bandage were removed, the baby always stared towards the pacifier that had just been suckled. This means that babies can perform trans-modal information transfers between touch and vision, so “the link between tactile and visual experiences is generated, in this case, through an innate constitution of the perceptual system, and not by the repeated experience of the world”, without the intervention or learning (VV.AA, 2000).

This means that we get information from the environment through perception, but it does not only capture stimuli, it also organizes it intelligently. For persons with visual disabilities, non-visual sensory stimuli are more significant and their perception is organized differently, so their information is more useful. This is why it may seem that a person with less sight has more hearing or tactile acuity, but they just need to make the most of the information they receive.

The sensory images that they create will have more or less visual content depending on the greater or lesser visual disability, so the less vision in a child, the more hearing, kinesthetic, smelling, etc. their memories will have.

Despite all this, the learning process becomes similar for all students towards the ages of 12-14, visually impaired or not, as long as they have been properly stimulated.

Regarding orientation and mobility, and to not repeat what has been already stated, we will only remember that spatial knowledge is more difficult for students with visual disabilities, because as we know, hearing and touching are not enough to interpret this type of information. It is in this sense that kinesthetic and tactile perception takes on special importance. The kinesthetic system informs people of the position of the body and the movements of the muscles and tendons, while tact and hearing are the main avenues of information and development.

Let us remember that perception involves all senses related to cognitive processes that help us interpret sensations (sight, smell, hearing, and tact) that reach the brain, developing knowledge and creating mental images. In people with severe visual impairment, like those with Albinism or Aniridia, the combination of kinesthetic and tactile systems gives rise to a new perceptual system: the haptic perception, result of tact informing of temperature, weight, consistency, etc., and kinesthetic perception informing of shape, texture, hardness, etc. By holding an object, the non-dominant hand provides static reference points while the dominant hand explores and makes movements on the object gathering information to form a global mental image of it.

Regarding hearing, it provides much of the information of the environment for a person with visual disabilities; it enables social interaction, orientation, and communication. Researchers have observed that all babies turn their heads towards the source of a sound from the earliest stages of development, although they do not become aware of the source object until one year old, but children with visual impairment make some adaptations of the reflexes to be useful. Leonhardt (1992) studied how the baby's first responses to sound are to turn the head and direct the face towards the source of the sound (like the mother's voice), but after a few weeks the baby stays still, his head no longer turning towards the sound. This immobility usually lasts only about 15 days, and the child then begins to make their first adaptation: when hearing a sound, they will turn their head in the opposite direction to its source, so one ear points to the sound, as if the ear "looked" at the sound . This behavior can be misinterpreted by parents, who think that they are rejected by the child when they speak to them, since they turn their faces away. It is very important to warn about it before it happens, so they continue to interact and stimulate the child as much as possible.

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For children with visual impairment, it is difficult to differentiate between important and nonimportant sounds, having to develop perceptual strategies that range from attention and awareness to selective listening and processing. Sounds are important for orientation and mobility, so children have to be stimulated auditory, favoring the development of their selective perception of significant sounds along verbal language with communicative intentions, while never using loud, unexpected sounds, due to the hypersensitivity they have.

Lastly, we have to reference the smelling and taste, since despite not being given too much importance, the exploration of the environment through these senses can provide information that complements the others. Smell can be useful to guide us in space or to inform us of the proximity of other people.

FROM 0-3 YEARS

Regarding this area of perceptual-sensory development at the end of the first cycle of pre-primary education, children should be able to:

- React to external stimuli.
- Pay attention to the sound and look for the source.
- Keep attention for short periods of time.
- Identify realistic family objects and toys by their use.
- Explore their own body and point to body parts.
- Do different symbolic actions in isolation.
- Start work in two-dimensional spaces and recognize three-dimensional objects.
- Understand up/down and quick/slow as sensor-motor activity.
- Master concepts like outside/inside and a lot/little, big/small.
- Begin differentiating shapes and textures.

FROM 3-6 YEARS

Regarding this area of perceptual-sensory development at the end of the second cycle of pre-primary education, children should be able to:

- Name shapes and recognize textures, temperatures, volumes, and weights.
- Identify smells.
- Name: above, below, in front, behind, and to the sides of objects.
- Link sounds to sources.
- Know heavy/light and same/different.
- Number concepts.
- Name body parts and their functions.
- Describe objects as soft/rough/smooth, first/last/middle.
- Differentiate loud from quiet sounds.

3.4.3 PSYCHOMOTOR DEVELOPMENT

Various studies show that psychomotor development is the basis for learning, intellectual development, and maturity of the nervous system. If the child receives adequate stimulation,

psychomotor delays are avoided and it contributes to the development of the body schema, the acquisition of walking, grasping, the organization of space and time, the learning of appropriate postures, spatial orientation, personal autonomy, etc.

At birth, all children have the same reflexes; children who see, thanks to environmental stimulation, spontaneously develop their motor skills; but visually impaired children have delays in their motor development, due to lack of vision, especially in activities related to movement. The lack of visual information impacts the development of mobility, because children have fewer stimuli to motivate their movement, less control of balance, cannot imitate visually, fear hitting obstacles, and sometimes an excessively overprotective environment. It is therefore important to motivate children through play to learn to stay seated, to hold onto sideways, change posture when laying down, crawl, kneel, or walk with help.

To teach them to walk, it is convenient to provide furniture or supports at their height to hold them upright and serve as references; also, place their feet on ours while you walk, so they can internalize the movement. Help them by taking the child by their hands and helping them control space and feel safe, offering places to hold on. They will usually be afraid of these autonomous movements, but the attitude of adults, respecting their rhythm and reinforcing any progress, will help them overcome this fear until they can walk independently.

Children must learn to recognize space and the things in it, having an orderly and safe environment, you still have to teach them (like all children) what can be dangerous (plugs, the oven, radiators, stairs, cleaning products, medicines…). A lack of stimulation and overprotection will prevent general motor development and poor control of the environment, so children will not develop a coordinated and safe walking, they may have stereotypical moves or posture, difficulties in understanding distance, movement, time, poor social interaction, and poor acquisition of body image, which is why it is necessary to implement early care programs.

On the other hand, the use of their hands will also be less developed. First they use each hand separately, but they will need to learn how to use both hands in coordination (two-hand coordination). For this, it is convenient to motivate them to put their hands together in the midline, so put objects on their chest. It is also useful to teach him to clap their hands, hit toys, play the drum, press toys with sound, or press keys or buttons that produce sound effects. This also helps them understand that their actions cause effects on objects, which is important in their development.

Regarding crawling, it is necessary to comment that it isn't very motivating for children with visual impairment, since they have to use their hands, which are their means to explore; it gives them a feeling of unprotection and they do not have visual stimuli to cause them to move. It is not convenient to force them, but it is useful to help them because it is beneficial for their general development and of their muscles, it is also helpful for them to learn to keep their balance when squatting.

Palm pressure and grip with three fingers (index, middle and thumb) appear later. Touching is a way of perceiving and knowing objects, so it is very important to awaken in them the fun of touching and teach them to explore with their hands and fingers. Children with low vision will understand the

"permanence of the object" (that is, that people and things continue to exist even if they are not within their reach) through touching. To help them in this important process, put their hand close to the object when they drop it or when they look for it, don't take the toy to the child. They will also learn through touch how to use objects, the characteristics of faces, basic concepts, spatial relationships, and the body outline.

With low vision it is more difficult to collect and process environmental information; a sighted baby quickly learns to see, pick up, and manipulate objects in the environment, but for a visually impaired baby, objects don't exist unless they touch them. They have more difficulty perceiving their body, so it is essential to identify body parts and body movements, left from right, to carry out different body movements, and to know the movements in another person they are touching, to understand the situation of objects regarding their body, the left and right of their body and of another person, the location of objects regarding their body and of their body regarding objects.

Throughout their first 4 years, children acquire space-time awareness, they will be able to anticipate what is going to happen step by step (grooming, food, sleep…), to react to the noises that let them know what is going to happen next, and thus changes will be more pleasant. If the child is with us while we prepare their bath, they will hear the noise of water, the smell of soap, the texture of the sponge… and we verbalize it, when we put them in the water, it will be more pleasant than if we put them into the bathtub without warning.

When children do not have enough stimuli or, if we overstimulate him, motor stereotypes may appear (repetitive actions unrelated to any specific objective, swinging of the trunk, pressing the eye with the hand, fluttering or speaking habits like automatic repetition of very short words or phrases without waiting for an answer, rigid and limited behaviors used as a guideline for social response). Some authors explain these stereotypes of children with visual disabilities due to the gap between their neurological maturity (which should allow them to make more movements) and the delay in mobility or the lack of motivation to move, since they do not see the environment and are not attracted to anything outside, because they do not see it, so a delayed mobility is a consequence related to visual impairment. Here are some general guidelines that may be helpful when working on psychomotor development with children with visual impairment:

- Develop coarse motor skills by promoting the child's evolution in aspects like sitting, walking on their own, developing balance…
  - Encourage exploring objects on the line of their central body axis (lying down or sitting).
  - Interact with them verbally and increase their motor activity naturally with daily activities, starting from the knowledge of their own body: body parts location, how they move, the situation of objects regarding their body, yours, etc.
  - Encourage the development of upside-down movements, like with blankets with sounds or different textures so they can manipulate them in a crawling position and facilitate their spontaneous mobility.
  - Acquisition of increasingly elaborate habits of personal autonomy (drinking, eating with cutlery, walking detecting obstacles with a small cane, etc.)

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- Encourage learning of walking by guiding their steps with direct support at first, and then on their own. Sometimes their safe walking can be facilitated by ropes that mark routes at home or at school to encourage children to walk safely.

- Develop fine motor skills by providing children with objects and toys with different textures for them to differentiate, classify, teaching how to use both hands in a coordinated way, drawing, cutting figures, molding clay, etc.
- Develop the body scheme, recognizing the different parts of the body and its basic functions, defining laterality and internalizing the concept of right and left.

Psychomotor education develops body movement, it strengthens the muscles so children can achieve a good posture and balance, and contributes to their social and psychological development, since they learn to control stereotyping, first acquiring spatial concepts, develop muscle memory, body awareness, the ability to develop concepts through the other senses, and lastly, the acquisition of adequate self-esteem is encouraged. Therefore, it is necessary that from the first moment, also at home, to carry out activities related to the auditory and psychomotor stimulation of the visually impaired child: clapping, listening to music, moving their hands and legs, stimulating crawling, walking, etc.

FROM 0-3 YEARS

Regarding this area of psychomotor development, at the end of the first cycle of pre-primary education the child should be able to:

- Coarse motor skills:
  - Roll over.
  - Integrate reflects.
  - Control their head.
  - Have a protection response.
  - Balance/support their own body.
  - Pivot movements.
  - Start walking.
  - Get on hands and knees.
  - Alternate feet when climbing stairs with support.
- Fine motor skills:
  - Pick by hand-ear coordination.
  - Palm pressure.
  - Reach objects.
  - Inspect hands/fingers.
  - Hit/shake objects and hold them with both hands.
  - React to the touch of various textures.
  - Turn the head towards sound.
  - Reach-grab (gripping).
  - Imitate actions with objects.
  - Put objects in a container.

- Explore trial and error.
- Stack cubes and rings correctly.
- Unbuttoning.

FROM 3-6 YEARS

Regarding this area of psychomotor development, at the end of the first cycle of pre-primary education the child should be able to:

- Coarse motor skills:
  - Handle toys that involve movement like tricycles.
  - Walking on tiptoe, backwards, and sideways.
  - Jumping on one foot.
  - Running without support and with support changing directions.
  - Follow rhythms.
- Fine motor skills:
  - String small beads.
  - Remove/fit small pieces.
  - Open and close wardrobe doors, drawers, and windows.
  - Wrap objects.
  - Cut 5cm curves on paper.
  - Model shapes in clay.
  - Locate with sound: close or far away.
  - Locate lost objects with sound.

3.4.4 COGNITIVE DEVELOPMENT

Cognitive development is a dynamic process resulting from the interaction of children with their environment through which they select and assimilate concepts resulting from the physical relationships of objects, people, each other, and oneself; in short, it is a process of structuring thought from abstraction to generalization. Since the sense of sight is a priority source of information from the environment, children with visual disabilities have a limitation in the interpretation of this information since it is incomplete, having to access the other senses more actively.

We have already anticipated that development is the result of the child's interaction with the environment; they perceive stimuli and select, organize, and assimilate them. Eyes are used to analyze what is happening around them, communicate with the people around, and anticipate what is going to happen. When the sense of sight is compromised, the interpretation of the stimuli of the environment arriving incompletely in the first stages of life can cause a slower and qualitatively different cognitive development than that of children with full vision; the objects perceived and that attract their attention are less than for full seeing children, so they have fewer opportunities to develop some skills, conditioning aspects of their development. Although this is true in most cases, there are other factors that may impact the cognitive development of children with visual disabilities: the specific limitation of their sensory input (visual acuity, visual field, functionality, etc.), slowness in perceptual processing,

the environmental limitation to which they might be exposed, difficulties they might have in interacting and the absence of suitable stimulating environments.

Although there is no concrete research regarding average cognitive competence in students with Albinism or Aniridia, the vast majority of professionals who have dealt with and worked with them describe them as students with great cognitive competence, generally higher than average. The student with low vision is usually curious, restless, and with hyperactive behavior, which in many cases are diagnosed with ADHD (Attention deficit and hyperactivity disorders F90.1 [314.01]) and in some others ADD (Attention deficit disorder with predominance of attention deficit F90.0 [314.00]); often wrong diagnoses for which psychostimulants are prescribed; a good diagnosis of ADHD or ADD in students with low vision must always come from a complete psychological examination, which should always include both observable behavioral aspects in all student environments and individual cognitive aspects in the student: attention, impulsiveness, and control of behavioral inhibition, always considering the specific needs to explore and learn they usually show.

FROM 0-3 YEARS

Regarding this area of cognitive development, at the end of the first cycle of pre-primary education children should be able to:

- Recognize family spaces.
- Understand and respond with their body “up” and “down”.
- Know and touch a part of their body when asked to.
- Understand “take the item” without sound.
- Go slow or quick when asked to.
- Open and close the legs when asked to.
- Find an item to their right or left when given these concepts.
- Know and use some basic spatial concepts when asked.
- Start the symbolic game: use gestures or objects simulating actions.

FROM 3-6 YEARS

Regarding this area of cognitive development, at the end of the first cycle of pre-primary education children should be able to:

- Remember a fact from the past (verbal memory).
- Develop the symbolic game.
- Discover all parts of the body, also the back.
- Acquire spatial, lateral, and temporal concepts.
- Use and master numbers and numbering.
- Representation of the permanent object.

3.4.5 AFFECTIVE–EMOTIONAL DEVELOPMENT

Emotional development is, in all children, with or without disabilities, the engine of general development; “The laws of human psyche are universal, what changes are the circumstances in which each subject must face life”. All children have to assimilate and progressively adapt to the world

around them, with visual impairment being a risk factor for emotional development, especially due to its repercussions on children's immediate environment and on their family, mainly in the relationship with the mother. Children's behavior and development depend on the parents, conditioning their response with their interactions and responses.

We all know the importance of the relationship of children with their parents, especially at early stages, when the affective bond of the baby is established mainly with their mother; a first contact made especially through sight. Low vision and the condition of persons with Albinism or Aniridia can condition this first relationship by doing it on spontaneous dialogue, stimulation, and imitation, since it is through sight that the emotional bond is fostered. For this, it is necessary that parents learn to identify the signs that guarantee the establishment of a good emotional bond, the germ of a secure attachment in children with visual disabilities, and the basis of a positive emotional development.

The child's gaze is instinctively designed to foster bonding and maternal care; although the child does not see, they emit signals that indicate that they recognize the mother. It is necessary for her to learn to recognize these signs to establish a good bond and a development in the child.

… "*The nurse helped us get closer to the child while explaining that, despite being so small, they perceived what was happening in their environment. She showed us the capabilities of the child, they oriented towards the sound, followed voices, was alert when spoken to, and showed how they liked it. This responsiveness was verified as an unknown person and their own mother called them almost simultaneously by name: the child moved their head and whole body towards their mother0s voice. If something bothered them, they used protection resources: sleep, cry, which is like drawing attention to be cared for*". (VV.AA, 2008)

Therefore, it is necessary for the child and mother to learn to communicate via non-visual signals (Leonhardt, 1998). Sometimes these signals must be taught to the parents, because they are so subtle that they can be unnoticed. "*Maria approaches her son, caresses his hand gently and begins to speak softly. The baby stops moving, stretches imperceptibly, and tilts the head to one side. At first, Maria thought that the baby did not like listening to her and so she turned her head, as if avoiding her company, but the professional explained what was happening. The baby was so interested in listening to her,* that he directed his ear towards her*, to listen to her better*".

Sometimes children turn their face to the side or lower their head in front of adults, behaviors that can be misinterpreted as avoidance, but this is the adaptive posture that the baby takes to collect more sound information from the environment, to concentrate. Parents can interpret it as disinterest, so it is essential to know the meaning of these behaviors.

In visually impaired babies, basic facial expressions are observed, but are less expressive and last less than in sighted babies; if these are not encouraged, they tend to decrease, so they should be reinforced by putting our hands on the baby's face, and their hands on ours, so they can internalize postures and movements. The visually impaired child begins to smile from 2-3 months. Parents should learn that their child's smile appears to respond to their stimuli and not spontaneously to initiate

interaction, it goes from the automatic smile of the first months to the selective smile of the 6 months that happens when there is an emotional bond.

Visually impaired babies show signs of fear of strangers between 7 and 15 months, just like sighted ones, and they show reject or cry in the presence of adults they do not know. This indicates that everything is going well and of good mental health; they calm down when they hear a familiar voice or feel a familiar face.

Sighted children seek proximity to the mother by extending their hands towards her from around 5 months old, since they just need to coordinate sight and arm/hand movement, but children with visual impairment achieve this from 10 to 16 months old, since they need to also have the concept of permanence of the mother even if they are not hearing or touching her.

Another behavior that has been discussed before is stereotyping or blindisms: repetitive, non-functional behaviors that children use to self-stimulate and compensate for the social isolation or lack of stimuli. For visually impaired children, contact with the world is more difficult to assimilate and less stimulating, so it is necessary to help them systematize and organize the daily life situations by constantly interacting with them through body contact, movements, and verbalization. Thus, it is very important that adults are around children to correctly interpret their attempts to communicate and to react to their demands. This is the objective of the intervention: to give families enough information and support to achieve children's growth and prevent delays in their development.

FROM 0-3 YEARS

Regarding this area of affective-emotional development, at the end of the first cycle of pre-primary education, children should be able to:

- Form attachment and later reciprocal relationships.
- Social smile, specific and differentiated regarding parents or caregivers.
- Search for new stimuli.
- Feel anxiety before unexpected or unknown stimuli (startles or reactions).
- Discover surprise and fear.
- Recognize positive and negative emotions in others (joy/anger).
- Develop empathic skills.
- Distinguish people by the emotional relationship with them.

FROM 3-6 YEARS

Regarding this area of affective-emotional development, at the end of the second cycle of pre-primary education, children should be able to:

- Affirmation and construction of oneself (personalism).
- Self-conscious emotions appear: shame, pride, guilt, envy, jealousy.
- Contain and self-regulate emotions.
- Recognize emotions and feelings of other people and characters in stories.
- Use terms like happy, joyful, scared…
- Increase emotional expressiveness; behavioral manifestations involving emotional states occur.
- A new type of affection appears: friendship.

3.4.6 COMMUNICATION, LANGUAGE AND SOCIALIZATION

Language is the most important way to learn and know the world around them for visually impaired children, to communicate with others and control their environment. Visual impairment does not appear to negatively influence language development, babies without sight also vocalize and play with language from the first months. Step by step they realize that their communication attempts are answered, and they learn to express their needs and desires. The important thing is that adults understand these attempts and respond to them, establishing a playful dialogue with the child, respecting their rhythm, and also leave them their space so they can respond. Around the first year, the first meaningful words will appear and they begin to understand "take" and "give". It is convenient to talk about things when the child is experiencing them, since their natural environment is their main source of motivation and stimulation to learn, and is what they need to develop.

Regarding non-verbal language, the visually impaired child will have more difficulties in expressing themselves, so it will be necessary to expressly teach them some of the actions or gestures that sighted children use spontaneously to communicate when they still cannot speak, like reaching out for contact or gestures like waving or saying "no" with the head. Imitation, symbolic play, motor development, perception, information, the attitude of the environment towards children, and above all the mother-child relationship have an impact on language development; "The first interactive processes are the base and nucleus for a later and correct development of the language" (Leonhardt, 1992).

The linguistic development of children with visual impairment is similar to sighted children as long as the environment does not overprotect them and help them understand and communicate, so this aspect is the least affected by low vision. Language allows the visually impaired child access to information and social relationships; the problem is that, although the baby has a good number of alternative behaviors, adults do not always interpret them correctly and the first forms of communication are altered. If adults learn to understand their communication signals, the baby will be able to communicate even pre-verbally.

In order for language to develop properly, it is convenient to get used to verbalizing experiences and communicating to children what is happening around them spontaneously. This contributes to understanding and knowledge of the world around them. Most researchers agree that the language development of visually impaired children can be within normal limits (it is an eminently auditory process, not visual), but there are some peculiarities:

- The child's communicative intention, which is prior to language, differs from the one developed by sighted children. Children with low vision cannot use gaze to draw adults' attention, nor communicate, nor point to the object they want, make gestures to provoke communication, or anticipate actions through objects or non-verbal language; all of this will be accomplished later.
- Sometimes, they can show articulation-type disorders, when substituting certain phonemes for others (for example, L for N or M), they tend to pronounce earlier phonemes whose articulation is not observable (K, D, T). This is also due to the lack of exercise of oral muscles, as the introduction

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of solid food is usually delayed due to overprotection. It is convenient to put the child's hands on our face, mouth, and throat so they can perceive the movements of the lips, articulation, and the vibration of the sounds.

- Visually impaired children use language in a non-interactive way more than sighted ones, with repetitions of heard words and phrases being habitual, without an experiential reference (verbalism). It is important that each verbal expression has an experiential meaning for the child, to describe daily events at home, at school, or on the street, the actions carried out by other people and themselves, and to describe objects and their characteristics.
- The absence of a visual channel does not seem to affect the development of morphosyntax.
- There may be a use of speech to control the environment, for example, asking insistently with the intention of knowing where you are, not to get information, or just to play with language.
- As for vocabulary, they use more specific and action names and fewer general names; they usually do not make overextensions (like calling "doggie" all 4-legged animals).
- Language is sometimes described as self-centered, but you must have in mind that it is difficult to speak of other people's actions when they cannot be perceived.
- Sometimes it is more difficult for them to know when they can start to speak and to respect the speaking turn in a conversation.
- Written language may show some differences; if they use the pen literacy system, they may need special tools and optical aids to achieve learning. When using the braille system, they will learn reading and writing at the same rate as sighted children, although it will be necessary to consider the specific methodology and didactics of their learning (these aspects are further explored in the chapter on the braille system).
- Regarding the use of pronouns, there is some delay and difficulties with the "me" and "you", so sometimes they use the third person or their name to solve it: "Child wants to play." To avoid this, propose game situations in which different roles are adopted and objects are exchanged: "give me your doll", "take my car", "I have a plane" and "you have a ball", etc. Fraiberg pointed out this difficulty that blind children have in acquiring the concept of "me" as: "The coherent, correct, and flexible use of the pronoun 'me' tells us that the child has achieved a level of conceptual development in which they do not only give themselves a 'me', but acknowledges that every 'you' is also a 'me' and that he is a 'you' to all other 'me's." (Fraiberg, 1977).
- Sometimes children use verbal concepts with which they haven't had direct experience, using words or expressions of visual content called "verbalism", but this does not mean that we should avoid words like "see", "sight", or "look". Not sighted persons also use them with a broad meaning related to sensory perception.

Socialization and social skills play a very important role in the development and education of the visually impaired child; in some aspects they suffer a certain delay in getting some social skills (relationship, non-verbal language, knowing how to sit at the table and correctly use cutlery, personal hygiene, clothing and maintenance of clothes…). It is important that children know, understand, and accept the norms and modes of social behavior of the different groups they are part of: family, school, friends… Sometimes, the family or teachers compensate children for their deficiency by tolerating their whims and forbidding nothing. This is very counterproductive to their development and

subsequent relationship with others, they must learn to tolerate frustration and respect the limits imposed on him at home and at school, to learn to internalize the basic rules of behavior that will contribute to their socialization and respect the needs and feelings of others.

FROM 0-3 YEARS

Regarding this area of development, communication, language, and socialization, at the end of the first cycle of pre-primary education children should be able to:

- Calm down with contact.
- Smile and laugh in appropriate situations.
- Pay attention, preferably to the mother's voice.
- Usually accept adult proposals.
- Claim and protest in a timely manner.
- Make a gesture to continue a game or activity.
- Establish differentiated relationships with other family members.
- Say no with their head.
- Respond differently when called by name.
- Establish meaningful communication and use some expressions with communicative intention.
- Answer simple questions.
- Kiss and bring the face closer to be kissed.
- Take pride in their successes.

FROM 3-6 YEARS

Regarding this area of development, communication, language, and socialization, at the end of the first cycle of pre-primary education children should be able to:

- Make compatible the positive and negative aspects of their significant figures.
- Bear the temporary absence of the parents.
- Establish a specific and meaningful relationship with the father.
- Understand and accept some rules.
- Take an interest in other children.
- Oral language predominates over any other form of gestural communication:
    - Sentences used are longer than before and with more complicated terms.
    - Mistakes in the pronunciation begin to disappear.
    - They answer simple questions about their immediate experiences - where and what.
    - They tell their name and how old they are when asked.
    - They use articles, pronouns, prepositions, adverbs, and verbs and their conjugation.

3.4 ACTIVITIES

ACTIVITY 1 - Check what you have learned; reflect on the following statements and try to find out the correct answer/s:

1. Do persons with low vision have a greater development of the rest of their senses?

a) Yes, innately, to compensate for their lack of vision.
b) By using the rest of the senses more and focusing attention on them, instead of on sight, they perceive more information and organize it better.
c) No, these are in fact less developed.
d) All answers are false.

2. Visual impairment imposes some differences on children:

a) Less motivation to move and inappropriate postures.
b) Verbalism and stereotypical postures or movements.
c) The permanence of items and symbolic play appear later.
d) All answers are correct.

3. Which of these statements is false?

a) Sight allows to gather information remotely and globally.
b) Sight helps integrate the rest of the sensations (sound, texture, weight…) and relates them to each other, so it helps to understand the world.
c) Sight provides a partial understanding of objects.
d) Visually impaired children perceive the environment in a fragmented and less stimulating way.

4. What can be the cause of stereotypes or blindisms in children with low vision?

a) Lack of motivation.
b) A gap between neurological maturity (which would allow more movements) and delayed mobility.
c) Wake up calls to pay attention.
d) Lack of vision.

5. All orientation and mobility programs must consider:

a) Evaluation of the remaining sight and to what extent it is usable for training and subsequent mobility.
b) Evaluation of mobility capabilities and spatial knowledge.
c) Analysis of the tasks to be taught and their sequencing, depending on the student's needs.
d) All answers are correct.

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6. What is haptic perception?

a) The result of the association of the tactile and kinesthetic perception system.
b) A system of perception, integration, and assimilation of sensations through active touching.
c) An exploratory system, not just a passive one.
d) All answers are correct.

7. Thanks to haptic perception, the student can gather information about:

a) Shape, size, texture, movement, and the relative position of objects.
b) Just temperature, pain, or pressure of objects in their body.
c) The vibrations and sound emitted by objects.
d) All answers are false.

8. Emotional development in all children, with or without disabilities, is:

a) One more aspect in general development.
b) An element unrelated to the development of other areas.
c) The engine of general development.
d) All answers are false.

ACTIVITY 2 – Toys in the early education classroom:

The choice of a toy for a visually impaired child must have the same goal that for any other sighted child. This is why we recommend inclusive toys, accessible to children with visual impairment and also appealing to normal sighted children. There are only a few aspects to consider when choosing toys like this in a basic way:

- If the child has a usable remaining sight, it is better to choose toys with higher color contrasts, allowing them to draw their attention to their different parts, functions, etc.
- Toys must be accessible to the visually impaired child through reliefs, sounds, tactile elements (shapes, textures), or elements that allow the location of the pieces. As for the reliefs, keep in mind that the best relief illustration could also not best fit the original visually; the simpler and more schematic a relief figure is, the easier it will be interpreted by touch. For example, a Parcheesi can be very colorful, but a blind child needs to be able to position the pieces on the board using tactile references for the squares, dice, etc.
- Always keep in mind that sometimes home-made adaptations can be made to toys to make them more accessible. For example, put on symbols in braille, elements with relief, tactile references that help children when using the toy that mark or highlight certain areas or points to make a toy accessible.

Taking this previous information into account, along with the objectives set throughout the Didactic Unit, as a teacher in an pre-primary education classroom, what kind of toys would you use to promote inclusion and work in each of the areas of development?

ANSWER TO ACTIVITY 2: SOME EXAMPLES[4]

- ***Sensory and perceptual development****: to develop attention, observation, understanding of the environment in an active and participatory way, visual, hearing, and tactile perception, differentiation of forms… for example: blankets with textures, sounds, and colors, toys, roly-poly toys, stuffed animals, music instruments, stackables, fitters…*
- ***Coarse psychomotricity****: toys that promote movement, balance, sensory perception, laterality, muscular control, strength, orientation, spatial organization, or coordination, for example: activity mats, walkers, foam rubber or cardboard structures, objects to stack and fit to build…*
- ***Fine psychomotricity****: for the development of handling skills, coordination, auditory, visual, and tactile perception, stimulation, and sensory integration… for example: carpets with auditory, visual, tactile, or sound stimuli; musical animals or dolls, stringing beads, fitting figures, puzzles, abacuses…*
- ***Cognitive development****: to understand the cause-effect relationship, the stimulation of reasoning and creativity, the development of observation, logic, concentration, and language. For example: toys to classify, order colors, sizes, shapes, textures, puzzles and fitters, memory games, bingos, texture dominoes, games of visual perception…*
- ***Emotional development****: toys that develop affection, the expression of emotions and feelings, that stimulate relationships with others and interaction. For example: dolls, stories, song CDs…*
- ***Communication and language****: to promote communicative intent, language understanding, hearing differentiation, listening skills, language, vocabulary, and grammatical structures. For example: whistles, blowing games, musical instruments, games with letters, numbers, or songs…*
- ***Symbol and role playing****: to develop imagination, language, vocabulary and communication, knowledge of the environment, shared play, and socialization. For example: dolls, cars, miniature animals, kitchen items, costumes, items related to jobs, building games, money replicas, circuits…*

[4] ONCE advice: What kind of toys are useful for visually impaired children? https://www.bloghoptoys.es/recomendaciones-de-la-once-para-elegir-los-juguetes-para-ninos-con-ceguera-o-deficiencia-visual/

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Looking out for a School for All

COURSE FOR
PRE-PRIMARY SCHOOL
TEACHERS

DIDACTIC UNIT 4

NEW TECHNOLOGIES AS A MEANS OF INCLUSION IN THE CLASSROOM

Looking out for a School for All

This is the educational material uploaded to VIRTUAL INCLUSIVE EDUCATION and developed by REDTREE MAKING PROJECTS in collaboration with SMALLCODES SRL, ASOCIACIÓN ALBA, ANIRIDIA EUROPE, ANIRIDIA NORGE, and ANIRIDIA ITALIANA within the project “LOOKING OUT FOR A SCHOOL FOR ALL: EARLY EDUCATIONAL INCLUSION FOR STUDENTS WITH LOW VISION”, co-funded by the ERASMUS PLUS PROGRAMME OF THE EUROPEAN UNION.

Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission.
This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the
Erasmus+ Programme
of the European Union

COURSE FOR PRE-PRIMARY SCHOOL TEACHERS

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"We need technology in every classroom and in the hands of every student and every teacher, because it is the pen and paper of our time and it is the lens through which we experience much of our world."

- David Warlick

OBJECTIVES OF THE DIDACTIC UNIT

At the end of this didactic unit, you will be able to:

- Understand and take on the concept of inclusive education within ordinary school.
- Have a greater conceptual understanding of the different special educational needs (SEN) within the framework of an inclusive pre-primary school.
- Identify the barriers of access that students with SEN have in the educational environment.
- Ground the importance of the use and integration of **Information and Communication Technologies (ICTs)** in pre-primary education.
- Analyze ICT educational resources that promote communication in students with visual impairment
- Select ICT and digital resources that favor the improvement of teaching and learning processes.
- Design an action plan with educational and didactic activities to be carried out with students with SEN using ICTs.

INTRODUCTION

Currently, the presence of technology in our daily lives is a relevant fact that we cannot ignore: society is changing, we are digitalizing and facing the information society. When society changes, all the elements that converge in it also evolve; consequently, if technology is linked to practically all daily life activities, its direct use in learning functions is increasingly implanted in the classrooms. The use of ICTs as one more element in the learning process and the increasing use of digital educational resources make technology one more tool for both teachers and students.

However, **for students with visual impairment, the use of technologies goes from being just another tool to being something extremely valuable** if one wants their learning development as a person to be at the level of their environment. ICTs and their use in classrooms is a fundamental tool to achieve an inclusive school, where the entire educational community participates in the same goal. However, technology allows us to carry out many daily tasks, **but it can also be a barrier for communication, if the used computer systems are not designed for all students**.

Consequently, it is very important, especially for the future students with visual impairment, to promote the use and approach of ICTs in pre-primary education.

4.1 ICTs AND INCLUSIVE EDUCATION

4.1.1 WHAT IS INCLUSIVE EDUCATION?

For some time now, we have been hearing insistently about inclusive education, but in order to approach this concept, we would like to comment or clarify a question prior to the beginning of this chapter that we consider important: school inclusion is not the same as school integration.

There is some confusion when it comes to understanding the concept of inclusion, since there are many who understand the school inclusion movement in the same way as the school integration movement, when these are two different approaches with different focuses of interest; we have not changed the name, it involves a conceptual change and therefore a whole process of re-structuring educational systems.

Note that inclusion is a theoretical construct that appeared in the 90s as an alternative to school integration. The *inclusive school* is the culmination of an upward path in the paradigm of caring for all students under the conviction that education is a human right, and therefore, a right for all people. From this perspective, "Inclusive Education" means not only to think about children with SEN, but also about those who live in poverty and marginality, those who belong to minority ethnicities, those who speak minority languages , those who live in remote areas, and those who are marginalized due to their gender or sexual identity. Therefore, it is to focus on all students, especially on the most vulnerable, those who tend to be excluded from the educational system[1].

As we pointed out, inclusion is not the same as integration, which is very valid at other times in the history of education, but implies acknowledging the situation of segregation of the person to be integrated, while inclusion implies acknowledging full equality.

[1] Referenced in AA.VV. (2017): "Utilización de las TIC en alumnos con necesidades específicas de apoyo educativo (NEAE). Diagnóstico y diseño de aprendizaje y evaluación", MINISTRY OF EDUCATION, CULTURE AND SPORTS, Directorate General for Territorial Evaluation and Cooperation, National Institute of Educational Technologies and Teacher Training (INTEF).

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"Including" means going from an individual model -where the problem or limitation is on the individual- to a social model -where the problems and limitations are in the society-, in other words, assuming full recognition of the individual rights and freedoms of people and the need to consider that communities are the basis of any learning, and that education only acquires its true dimension if it takes place in relation to other people and in the same contexts for everyone. More than an educational, didactic, pedagogical, or psychological current, inclusive education is a true philosophy and a frame of reference for educational practices.

The inclusive school is the currently accepted educational approach to tend to all students from their acknowledgement as human beings with the same rights as their peers. Inclusive education means taking on the challenge of a quality education that is unique, equitable, and equal for everyone, thus establishing new professional, curricular, organizational, and structural practices that can answer individually to the particular characteristics of the students.

Consequently, and in our understanding, inclusive school and inclusive society are two sides of the same coin, necessary for each other, with a level of interdependence that cannot be understood in isolation. This, perhaps, is the essence of the inclusive school, which makes it clear that school cannot educate without the concurrence of the community, and from this new paradigm, the school cannot *include* without an *inclusive* society. However, we are also aware that there is no clear definition of "inclusive school"; the most representative authors in this regard provide different views on the inclusive fact and how it impacts educational organizations.

Considering this fact, and based on the case at hand (attention to children with SEN), in this guide we will consider the opinion that students participating more or less in the curriculum is not only related to their own problems or difficulties, but it says a lot about the curriculum itself and its level of adjustment regarding specific circumstances, the level of sensitivity, or the prognosis. In the same way, we take the idea that *including* does not oppose the need for some students to receive specialized attention or leave ordinary classrooms temporarily to receive special attention in support classrooms.

On the other hand, we know that there are many schools that speak of inclusion in terms of integration, and many that speak of integration in terms of inclusion, but as we pointed out at the beginning, the main difference lies in the essence of the concept, in the philosophy that refers to one and the other.

It should be remembered that referring to integration requires acknowledging the existence of a prior state of disadvantage or segregation of the student to be integrated. However, inclusion comes from the premise that students with functional diversity or SEN are part of the school, recognizes diversity regarding the different starting points from which learning processes of the students begin, and the different points of arrival that can be considered educational goals. The base of the inclusive school is configured on equality, equity, quality, cooperation, and solidarity, promoting the appreciation of differences and understanding it as an opportunity for mutual enrichment for all agents of society (Esteve Mon, Ruiz Agut, Tena Benages, & Ubeda Prades, 2006).

But including is not an easy task. The great challenge of inclusion is building a school with enough breadth in physical, organizational, and curricular design, to provide an individual response to the particularities of all students, without differences. It is not about making adaptations to specific cases, it should be the school itself -through its organization and curricular proposals- who must satisfy the needs of all students. The essence of the inclusive school is the educational community, who seeks and promotes the educational success of all its members, taking as a premise the facilitation of learning through the participation of all students (Stainback, 2001).

Including is, in the words of Huguet Comelles (2006):

- To modify the contexts so all students participate.
- To abandon disabling conceptions to recognize the special conditions of some persons, which are not an obstacle to offer them the same opportunities as the rest.
- To acquire a commitment of improvement that impacts both the educational practices -the curriculum- themselves and the learning levels or the professional and organizational development of the community.
- Rethink the concept of SEN.

Inclusion is a coherent evolution of the educational practices that have preceded it, and whose main characteristics are the suppression of special education as a concept; the creation of real supports that collaborate with teachers in daily educational practices within ordinary classrooms; and rejecting the classifications focus on handicaps from the medical point of view as an element for categorization and use of broader evaluations that allow the design and development of individualized learning processes in the educational field. Likewise, it is also necessary to create a standard curriculum that allows the necessary adaptations of resources and organization in each case. Inclusion undoubtedly implies the need to recognize diversity as a social fact present in the classroom. To sum it up, we can state that the main concern of inclusion is to pursue the transformation of culture, educational organization, and school practices.

In this context, ICTs incorporated in the development of educational projects can play a key role in facilitating a qualitative improvement of the teaching and learning processes, developing skills and competences, tending to the uniqueness and individual needs of each student, and enhancing motivations that make learning meaningful.

4.1.2 THE ROLE OF ICTS

The relationship of ICTs with Inclusive Education can be perceived from a double perspective: on the one hand, their use can favor the achievement of a quality education and eliminate the barriers that hinder the approach of all persons to the educational fact, since for some persons technology is the only way to access the educational and cultural world; and on the other, that with its design we can enhance both the creation of accessible but also disabling environments that do not enable access certain groups, thus creating a new form of social exclusion.

However, ICT projects aimed at vulnerable groups generally are an interesting educational alternative to achieve their inclusion in the society of knowledge, since they allow the creation of enriched learning environments that can alleviate the social, school, and cultural deficits of subject, while fostering equity in access to the quality of learning and favoring their access to knowledge not located in their immediate context.

Professor Cabero[2], at the 1st International Meeting on Inclusive Education held in October 2014 in Pátzcuaro (Mexico)[3], carried out an analysis of the possibilities that ICTs can bring to Inclusive Education from four main perspectives, and to which we are going to refer to in this section:

- Towards universal design in ICTs.
- Closing the digital gap.
- ICTs to promote personalized attention.
- The use of ICTs for the social inclusion of different groups.

Regarding the first point, towards the search for a "Universal Learning Design" (ULD), it is important to consider not designing them in a way that prevents certain students from accessing them and taking advantage of the possibilities that offer. From this perspective we must look for design principles, both in hardware and software, that facilitate their use by all users. As has been shown through different studies, different ways of designing ICTs can prevent access to them by people with certain physical, cognitive, or cultural characteristics, for example: using low contrasts in the combination of colors, or the use of images and graphics without a description, hinder the approach to information to people with visual problems; not subtitling videos or the description of the commands with audio hinder the access to the technologies by subjects with audition impairment; poorly organized pages or screens with overflowing information slow down the interaction in subjects with cognitive deficit; small buttons close to each other, or not being able to control the time of entry and exit to certain pages make access to information impossible for subjects with motor problems; or the resources being in just one language prevents interaction for people who do not know it. In other words, not reflecting on the design of ICTs can lead us to create disabling environments.

Recently, one of the movements that is gaining importance in the field at hand is the ULD, which refers to the design of products and environments that can be used by every person to the fullest extent possible, without the need for adaptation or specialized design, regardless of the person's age, characteristics, or abilities. This perspective began to develop in the field of architecture, but as several authors point out, its principles are applicable to any product or environment, including "*curriculum,*

[2] Julio Cabero Almenara is a Professor of Didactics and School Organization at the University of Seville. He is the director of the SAV (Secretariat for Audiovisual Resources and New Technologies) of this university and a founding member of Edutec. He has published different works on the subject of educational technology and new technologies applied to education (Educational Technology. Design and use of media in teaching, Paidós, 2001; New technologies applied to education, Synthesis, 2000; The image of the professor and teaching in the media, University of Seville, 1998).

[3] Fernanadez Batanero, J.M. y Cabrero Almenara, J. (2017): "Una mirada sobre las TIC y la Educación Inclusiva, Reflexión en torno al papel de las TIC en la Educación Inclusiva". Centro de comunicación y pedagogía. http://www.centrocp.com/una-mirada-sobre-las-tic-y-la-educacion-inclusiva/

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teaching, employment guidance offices, multimedia, study support centers, conferences, museums, microwave ovens, computer labs, work centers, and web pages".

The ULD is based on a series of principles such as:

- **Equality of use**: the design must be easy to use and suitable for all persons regardless of their abilities and skills.
- **Flexibility**: the design must accommodate a wide range of individual preferences and abilities.
- **Simple and intuitive**: the design should be easy to understand regardless of the user's experience, knowledge, skills, or level of concentration.
- **Easy to perceive information**: the design must be capable of exchanging information with the user, regardless of their environmental conditions or sensory capabilities.
- **Tolerant to mistakes**: the design should minimize accidental actions that can have fatal or unintended consequences.
- **Little physical effort**: the design must be able to be used effectively with the least possible effort.
- **Appropriate dimensions**: size and spaces must be appropriate for the scope, handling, and use by the user regardless of size, position, or mobility.

For the specific case that concerns us, fortunately, a whole field of research and work has been developed around the achievement of accessibility by persons with visual impairment. All those devices, programs, hardware, and software, specifically designed to make information technology accessible to blind persons or with low vision are called "*tiflotechnology*".

Tiflotechnology

It bases its research and development on resources that facilitate the access of blind and visually impaired persons to the computer and any devices and autonomous systems with their own utilities, specifically developed for blind and visually impaired persons. Linked to it, we see how more and more attention is being paid to the issue of accessibility, from the field of educational research. Regarding the digital gap, the greatest exclusion from ICTs that can be made to a person is that they cannot access them for economic, social, or educational reasons, and unfortunately one of the problems we find today is that ICTs that can facilitate the approach of persons to a state of cultural, leisure, and economic well-being, are serving in some cases to prevent people from accessing them, since it is complex -or impossible- to use them.

The digital gap

In a simple way we can say that the digital gap refers to "*the differentiation produced between those people, institutions, societies, or countries that can access the web and those that cannot; it can be defined as the inequality of possibilities to access information, knowledge, and education through new technologies. Consequently, these persons are marginalized from the possibilities of communication, training, economic impulse, etc. that the web enables*" (Cabero, 2004).

We cannot forget that there is no one single digital gap -linked to economic conditions- which prevents certain regions and groups from accessing the web and the possibilities that it offers, but different types of digital gaps, like the physical and cognitive characteristics of people, their gender, language proficiency, culture, educational level, and age. We also can consider that the concept of digital gap has expanded nowadays: it does not just refer to *having access* to technologies, but also *accessing* them, that is, not having enough competences and capabilities to use them in a specific way.

Regarding ICTs, they favor personalized attention, and as authors such as Cabero, Córdoba, and Fernández (2007) already point out, and help to overcome the limitations derived from cognitive, sensory, and motor disabilities of students, specifically:

- "They favor the autonomy of the students, being able to adapt to the needs and demands of each student in a personalized way.
- They promote synchronous and asynchronous communication with the rest of the classmates and the teaching staff.
- They save time in the acquisition of skills and abilities in students.
- They favor the diagnosis of the students.
- They support a multi-sensory communication and training model.
- They promote individual training.
- They avoid marginalization and the digital gap, which includes being deprived of using the development tools of the society of knowledge.
- They facilitate the social and labor insertion of students with specific difficulties.
- They provide moments of leisure.
- They promote the approach of these persons to the scientific and cultural world, and help being up-to-date with the knowledge that is constantly being produced.
- They favor the decrease of the sense of academic and personal failure".

Hence, policies for incorporating ICTs in schools favor the development of Inclusive Education, but again, this happens not only due to the presence of ICTs in the classroom, but also by reflecting on their design and the skills the teacher has for their use.

To finish, we would like to add a series of factors pointed out from "Center for Communication and Pedagogy" that can favor the incorporation of ICTs in Inclusive Education:

- "Establishing clear policies for the use and incorporation of ICTs for Inclusive Education from the administration.
- Clear support of the heads of educational institutions for their incorporation.

- The presence of ICTs in classrooms in a way that favors their "invisibility", and the existence of teams that favor their adaptation to the characteristics of the students.
- Clear training and support policies for teachers for the incorporation of ICTs for Inclusive Education.
- The organization of transfer policies of good practices and collaborative work between teachers.
- The incorporation of subjects to the initial training plans for teachers that favor the incorporation of ICTs for Inclusive Education.
- Boosting the research for new proposals for media design and the search for teaching strategies and methodologies for subjects with certain characteristics."

In conclusion, the incorporation of ICTs must go through teacher training (teachers have to know social reality and the historical moment that serves to promote student reflection and take responsible and prosocial positions as future citizens), the transformation of the organizational structure of schools, and the adaptation of measures to enhance the visibility of ICTs in schools.

4.2 ICTs AS AN INCLUSIVE RESOURCE IN EARLY EDUCATION

As we have pointed out, it is undeniable that ICTs are becoming increasingly important in our society and consequently generate greater dependency. We are immersed in the "society of information", although sometimes, we don't realize it, and even more on pre-primary school. Wanting to get out of it would only reduce our chances of moving education positively toward new expectations. The school, as an educational agent, must use ICTs to train and prepare its students, so educational institutions must be open and flexible in the face of advancements in society, to introduce and adapt them to the needs of students.

Over the last few years, the educational system has been promoting digital literacy and introducing more changes in classrooms that make ICTs an everyday tool for educational purposes, which we must promote from early ages. However, the introduction of ICTs in the classroom must be coupled with training for teachers, since the philosophy of work by competences -and specifically the one in this section- involves a methodological change in our daily practice.

4.2.1 ICTs IN EARLY EDUCATION CLASSROOMS

Currently, children assume the presence of technology in society as normal, they live with it and adopt it without difficulty for their daily use, so teachers must promote an up-to-date education for our times, making new didactic proposals and introducing the necessary tools for this purpose.

It is at three years old when most children have the first contact with school, but this chapter will also speak of pre-primary education, meaning from 0 to 3 years. In the past, there wasn't a great

importance attached to this stage, but we now know its relevance, since it is there that the foundations for future learning are laid, behavioral and coexistence habits are acquired, and great changes of intellectual growth take place, acquiring great capabilities for learning, etc. These and other characteristics mean that education in this period is essential for subsequent development, and should consider the use of ICTs as a resource adapted to the rest of the curriculum, to promote:

- The stimulation of creativity.
- Experimentation and manipulation.
- Respecting the learning pace of the students.
- Working in groups, favoring socialization.
- Curiosity and spirit of investigation.

Thus, we consider that the knowledge and use of ICTs in preschool age is important to allow children to develop different tactile, auditory, and visual skills while accompanying the cognitive development of boys and girls. We also must not forget that the use of technologies in the classroom is a motivational element, since it allows to look for information and generate strategies, making small decisions to choose, filter, and select.

Schools with ICTs integrated into pre-primary classrooms are becoming increasingly common, especially from 3 to 6 years old: PCs, tablet devices, projectors, digital whiteboards, digital cameras… There are many chances to use ICTs in pre-primary education, due to the contributions they offer:

- Creating autonomy in the student, with the help of an adult.
- Promoting cooperative and collaborative use among students.
- Improving motor skills.
- Helping to develop content systematically.
- Facilitating the understanding of concepts.
- Stimulating new learning.
- Motivating communication, both among peers and between teacher/student.

ICTs can also be worked on in the 3 areas of the pre-primary curriculum:

- Self-discovery.
- Discovery of the environment.
- Intercommunication and languages.

However, we have to point out the aspects that may be negative if they are misused or overused: at the pre-primary stage, education based on play and real experiences with objects, the contact with others and with nature, reading stories, and emotional and social development is also essential. Although social, cooperative, and collaborative development can be promoted through the use of

technologies, we must not neglect face-to-face socialization with physical contact. As teachers, we have the responsibility and duty to teach how ICTs work and are used, but we must also educate in their critical and responsible use.

4.2.2 THE USE OF ICTs WITH STUDENTS WITH S.E.N.

Since children are born, they are immersed in a fully *technified* society, so the presence and use of ICTs in the classroom is an extension of daily life for them. ICTs are therefore technological and audiovisual language tools, pedagogical and didactic resources that offer us endless possibilities to develop work strategies in the school environment too. This emerging change in the educational context means that ICTs are not complementary tools, but in fact are necessary for learning and knowledge nowadays. They also improve the quality of life, normalization, and social and occupational integration of people with visual impairment. This is why the use of technologies with people with SEN provides us with the resources to overcome specific difficulties and with benefits in the field of communication between the student and their environment, while facilitating their incorporation into the society of knowledge.

Thus, ICTs are an innovative medium that considerably expands the current supply of materials to work in learning contexts. In order to acknowledge diversity, we must also have diversity in our materials and resources, to help us carry out our educational work in a context of individualized education. According to Gutiérrez, Yuste, and Borrero (2012), new technologies can be regarded as elements to facilitate access to the curriculum for the different types of students and their different difficulties or disabilities:

- Visual ones: with image amplifiers, text converters, etc.
- Motor ones: with adapted tables, writing supports, etc.
- Hearing or speech ones: with headphones or earphones, accessories to stimulate the speaking apparatus, voice control, communicators, etc.

ICTs also have a series of advantages to work with students with SEN, which the same authors specify:

- They help overcome limitations derived from cognitive, sensorial, and motor disabilities of the students.
- They favor the autonomy of the students.
- They favor communication with the rest of the students.
- They promote individualized training.
- They facilitate insertion.
- They provide moments of leisure.
- They save time in acquiring skills and abilities.
- They diversify play and discovery experiences.

- They promote problem solving with different levels of difficulty.
- They favor personal and social development.
- They develop expression and therefore communication.
- They enhance interaction with the environment.
- They facilitate the development of autonomy, expression, and communication.

We can also state that ICTs facilitate certain tasks for teachers, especially for pre-primary education teachers: planning, systematization and presentation of information in a more organized way, adaptation of technical/ technological means to developed projects, and enhance interactive communication with the student. Therefore, students benefit on a personal level through ICTs, with a notable increase in self-esteem, autonomy, independence, confidence, motivation, and increasing their self-concept, leading to their social inclusion.

Lastly, and for all this to be possible, the use of ICTs will depend on the type of each educational need: visual, auditory, cognitive… For example, for visually impaired students -the case study that we are dealing with in this guide and which we will therefore deal with in greater depth in the next section- the use of digital technologies in the classroom may mean the possibility of accessing many curriculum activities that were previously impossible or seriously difficult for them: access to information in real time and selecting what they need, taking it to their computer and printing it, and following the teacher's explanations, which was previously a serious problem for students with low vision and was practically impossible for students with total blindness.

Although it is true that progress has been made in this area in recent years, the limitations that this type of technological material has are also true, such as the fact that it is usually standardized and does not cover all the existing diversity needs, the need of having prior computer knowledge for its correct management, etc. Thus, teachers must know how to guide resources towards the contents and attitudes they want to work on, and properly select the tools they will use.

4.3 DIGITAL RESOURCES FOR STUDENTS WITH VISUAL IMPAIRMENT

For teachers with visually impaired students, working in a digital classroom involves a double challenge: on the one hand, adapting the work methodology to the new tools, and on the other, making the methodology flexible enough for it to be followed by all students in the class. In this sense, we again point to the same topic: accessibility.

Currently, teachers have two options when locating digital resources: either resort to the different platforms organized by the Ministry of Education or territorial governments, publishers, or private entities, or develop their own resources with copyrighted tools. In the first case, the resources that exist in educational platforms are often still scarce and have a low level of accessibility; and in the second and in general, in the development of its own resources they lack knowledge to make them accessible. Teachers with a student with a disability in their classroom must have basic accessibility

knowledge, both to search for resources on the Internet and to be able to adapt or develop their own resources.

Nowadays in Spain, the Autonomous Communities and ONCE are providing students with visual impairment with a series of typhlotechnical tools -by age and course- to adapt the study position and help the student solving certain computer access problems. ONCE Digital Educational Content Accessibility Group (Grupo Accedo) -comprised by teachers, professors, typhlotechnical instructors, technicians in relief adaptations, computer scientists, and psychopedagogues- works on the investigation of the use of other tools of general use that, on their own or combined with any of the above, can provide special support -both to the student and teachers and family- when working with digital educational resources.

Other functions of Accedo Group are the study and evaluation of accessibility in digital educational resources, providing advice -in terms of accessibility- to public entities and private companies in charge of developing this type of resources, and to professionals, teachers, and families. It also trains teachers in accessibility and in the use of support tools, in the evaluation of students, and in choosing which support tools are the most adjusted to their needs and tasks to perform, both at school and at home. For more information see the following link:

- https://educacion.once.es/informacion-general/grupo-accedo

Support technologies currently being implemented in digital classrooms for students with low vision or with a remaining functionality are, in general terms, the following:

- **Digital whiteboard (0 to 6 years old):** a system generally made up of a computer and a video projector, which allows showing digital contents in a format suitable for group viewing. One can interact with the images using the computer peripherals: mouse and keyboard. The projection surface can be a whiteboard (recommended), a projection screen, or even a white wall. Interaction is necessarily carried out with the computer peripherals, which should be wireless, such as using Bluetooth.

- **Interactive digital whiteboard (0 to 6 years old):** like the digital whiteboard, this allows digital contents to be projected onto an interactive surface in a format suitable for group viewing, and allows direct interaction with the projection surface. The added value compared to the digital whiteboard is that it allows to interact directly on the projection surface using a stylus or with your fingers if it is tactile; the projection surface is usually a whiteboard that includes the pointer control device. There is a version in which the transportable external box can be attached to any whiteboard, called “portable interactive whiteboard”, and another that allows it to be moved from one place to another with a foot support.

- **Vega 1.0 prototype (3 to 6 years old):** a system designed so persons with low vision can follow a lesson, lecture, or presentation via a portable device anywhere in the room. It consists of a camera system and software designed for this purpose, which allows three simultaneous signals to be sent in real time (without latency): the speaker’s image with real-time monitoring, the signal of the

presentation projected by the speaker (the screen of the speaker's computer) and the image on the whiteboard (if there is one for the speaker to write something on it).
Attendees with low vision receive these three signals and can alternate any of them on the screen. The software also allows them to zoom in on any of them, enlarging as much as necessary any area, and increasing screen contrast until the image turns to black and white. This system is fully portable, requiring no installation (just plugging it into a power outlet).

- **AbleCenter® (3 to 6 years old):** it allows to zoom-in any content in the classroom using a camera and a computer; a camera installed on the ceiling sends images wirelessly to the devices of the students, making it easier for them to read any text or view any content.

- **Individual monitor of the digital whiteboard (0 to 6 years old):** the use of digital whiteboards has revolutionized teaching, but for persons with or aniridia albinism these are still whiteboards inaccessible to them, so the use of an individual monitor connected to the whiteboard may be the solution. It allows students to stay on their seat and have access to the information in the whiteboard, and is an integrating element in the classroom. For the monitor to be a useful tool, the activity to be carried out in the whiteboard must always be zoomed-in, checking that the students can perceive it well with that zoom or if it is insufficient.

- **Laptop (3 to 6 years old):** for students with visual impairment, screens are recommended to be larger than 20 inches, both on desktop computers and tablet devices. The use of mini-computers, with 9- or 10-inch screens supposes an accessibility problem in most cases, even using adaptations such as screen magnifiers, since its size does not allow enough information to be able to work. The choice of a computer depends on the size of its screen and the characteristics of the student's vision, so it will be the result of the exploration of visual functionality and the decision of the measures that guarantee its accessibility.

- **Tablet devices (0 to 6 years old)**: these have been beneficial for students with severe visual problems, since their size, weight, and location and handling possibilities allow students great flexibility when working. Students with severe visual impairment can choose the inclination of the screen, its proximity, control its brightness, etc. They also offer the possibility of working directly on the screen using a pencil that doubles as a mouse, favoring hand-eye coordination and increasing ease of use and motivation.
  There is a great introduction of this technology in schools, providing all students regardless of their educational needs with a tablet device -usually 9.7 inch screen, which has evidenced the need to change them for larger ones, since these are not functional enough-. In schools where students have been provided with tablets whose screens are not functional for them, they have been diagnosed -after evaluation- with the use of larger screens, typically 13-inch screens are being used.

- **Screen Reviewers (3 to 6 years old):** this software allows students with severe visual impairment to access the different functions of the computer, facilitating its use. It has two main functions: allows users to detect the elements displayed on-screen at all times, and allows them to interact with the

applications, filling in edit boxes, selecting elements from lists, reading -either by voice synthesis or in braille through a braille line- text boxes, or any other actions carried out to operate an application. This interaction is done using the keyboard, since a blind person cannot use the mouse. There are currently different screen reviewers, some of them for free.

- **Touch screen (0 to 6 years old):** this monitor connected to a computer allows to work on it directly with finger presses on the screen itself. Clicking, right-clicking, dragging, and activating links can be done with one's fingers, just as with the mouse.

- **Interactive digital screen (0 to 6 years old):** another type of screen to be used with one's finger or with a magnetic pencil. Found in different sizes, the most common being 15, 17, or 19 inches, with a glass screen, flat, and with adjustable inclination, allowing visually impaired students to adapt it to their lighting needs, and as a computer screen, it can be configured to their needs. It must be connected to an image source, either directly to a computer or to a projector.
  They include specific software -like whiteboards- that allow to better use their functions, like recording (audio and video) everything executed on them, allowing students to re-watch any lesson when needed. This type of screens allows students not only to follow the lesson from their seat, but also to work on their screen and have their work shown on the classroom screen.

- **Virtual platforms (3 to 6 years old):** the maximum introduction of digital technology in schools has continued with the implementation of virtual platforms as the basic context for curricular materials; printed books disappear and become part of these virtual platforms to be consulted, studied, and work on by students. They host teaching materials and learning activities in a logical and organized manner, according to the structure of an academic program, to make them available to students and teachers and establish educational relationships. Although this has been a great economic, ergonomic, time, and educational quality advantage, it has meant a setback in the accessibility for persons with visual impairment, since basic applications allow just a x3 magnification (generally in iPads), which is not enough to be functionally accessible for students with severe visual impairment, like persons with albinism or aniridia. Until virtual platforms do not solve these obstacles, we will defend the alternative use other file formats with proven accessibility, which have been a breakthrough without any extra costs for the publisher, the school, or the family: books in PDF format.

- **Software (3 to 6 years old):** both PC, laptops, and tablet devices usually include software that allows the recording of screenshots or everything done on the whiteboard, so students can repeat all or part of the lesson without having to take notes, promoting their understanding of the explanation. The accessibility functions developed in the operating systems are also useful, allowing to modify parameters like the size of icons, menus, cursor bars, and color contrast. But this is not enough for students with severe visual impairment, even the virtual platforms introduced in schools replacing books and other printed materials with the purpose of accessibility and inclusion have not been able to solve this obstacle. To date, the PDF file format has been the best response.

The different publishers, not always with the desired speed, have provided the materials for visually impaired students as PDFs, which has allowed access to the same materials and at the same time as their peers. They can be used to consult and even write on any device (tablet device, PC, and laptop) as long as you have the appropriate software (Adobe Acrobat, Adobe Reader, and PDF Annotator all of them developed by Adobe Systems). The Portable Document Format (PDF) displays text in a neat visual design, allowing large magnification without a loss of visibility. It is very popular and has versions for the most used operating systems: Microsoft Windows, Mac Os, iOS, Android, and Windows Phone. Through the PDF Annotator application, students would have all the aforementioned benefits, in addition to being able to write with a magnetic pen and with their finger on a digitalizing screen. In all cases the final document, with the added annotations, could be saved and printed.

Directive 2014/26/EU of the European Parliament and Council of February 26th 2014, and with Directive (EU) 2017/1564 of the European Parliament and Council of September 13th 2017 in its Article 31 "Accessibility for people with disabilities" has meant a great advance in the accessibility of students with visual impairment. According to its 2nd point, "in those special cases that do not conflict with the normal exploitation of the work, and that do not excessively harm the legitimate interests of the owner of the right, the authorized entities established in Spain that produce copies in accessible format of works for the exclusive use of blind persons, the visually impaired, or with other difficulties to access printed texts, may carry out the acts of the previous section in the manner referred to therein, for the exclusive use of said beneficiaries or an established authorized entity in any member state of the European Union".

- **Screen readers (0 to 6 years old):** a software that reads both the text and individual elements in the computer screen. It reads aloud and can be heard through speakers and/or headphones, if connected. Among other possibilities, they can describe icons and graphics. They were initially intended for students with total blindness, but are also useful for students with visual impairment as they help reduce eyestrain.

- **Digital books (e-books) (0 to 6 years old):** reformatting devices respond to the specific needs of visually impaired students, as they have the ability to change the size, contrast, font, background, and color. The two most common reformatting e-book formats are *Mobi* for Amazon Kindle and *epub* for all other major devices including Apple iPad and iPhone, B&W Nook, Kobo, Google Play, and OverDrive (a reformatting document is a document that can automatically rearrange its layout to fit any output device).

  E-books can be read with audio assistance, both with a smartphone and a tablet.

- **Smartphones (from 8 years old):** some smartphones and tablet devices have default accessibility options like zoom, color inversion, audio output, etc. Apple devices especially are equipped with an integrated screen reader called *Voice Over* pre-installed in smartphones, tablet devices, televisions, and smart watches.

Android OS devices have a similar app called *Talk Back*, which is often pre-installed or can be installed manually. The *Daisy* format enhances the particular features that enrich the reading experience, like navigation, bookmarks, spelling, notes, etc.

- **Voice synthesizer (from 6 years old):** a software that converts text from an digital document into audio using a synthesized voice very similar to the human voice. Speech synthesis software is available in multiple languages that can coexist in the same device, making it easy for students studying a foreign language to convert long texts into audio. Some text readers also combine zooming with voice synthesis, enabling both visual and auditory perceptions to be activated.

- **Robo-braille service (from 6 years old):** it converts digital materials into accessible alternative formats for visually impaired students; free to access via email and its website (http://www.robobraille.org). It can convert educational materials and other texts into a variety of accessible formats, including mp3 files, e-books, digital audiobooks, and Daisy, and is also useful for converting scanned images and PDFs into more accessible formats. It offers visually impaired students the ability to convert Word documents and Math Thype to Daisy (audio), e-book, EPUB, EPUB3, Mobi Pocket (e-book), and other documents that would otherwise be inaccessible, such as image files (gif, tiff, jpg, bmp, pcx, dcx, j2k, jp2, jpx, djv) and PDFs with just images, all kinds of PDFs, doc, docx, Word xml, xls, xlsx, csv, text, rtf and html. Word and rtf files are converted to PDF files according to the format specified by the user in the Subject field, for example, txt or pdf. The knowledge of this service comes from Italy, where its use is more frequent, and may be useful in other European countries since its conversion service includes high-quality voices in -among others- English, Italian, Danish, Spanish. As of today it does not include Norwegian.

4.4 ACTIVITIES

Reflect on the following statements and try to answer correctly.

1. The development and evolution of technologies should follow the principle of:
   a) Programs with adaptations.
   b) Design for everyone and universal accessibility.
   c) Everything can be adapted.
   d) Accessible hardware.

2. What implies that digital resources are not accessible to everyone?
   a) It is not a problem, adaptations can always be made.
   b) Persons with visual impairment can communicate with the classic writing and reading methods.
   c) It limits social and educational inclusion.
   d) Technology advance cannot stop for persons with disabilities.

3. Which tiflotechnology elements could the adaptation of the study place have for a student with residual vision?
   a) A PC with zoom test.
   b) They depend on the residual vision.
   c) Screen readers.
   d) A tablet device.
4. What is the digital format of documents/materials that is having a better response to the educational needs of students with visual impairments?
   a) *.doc* and *.docx*.
   b) *rrt* and *html*.
   c) *.jpg* and *.tiff*.
   d) *.pdf*.

5. ICTs are a relevant element for the inclusion of persons with visual impairment in the field of:
   a) Education.
   b) Social and labor.
   c) Leisure.
   d) All of the above.

Design a study station adaptation for a 3-year-old student with Aniridia or Albinism (residual visionder of 20%) who is starting the second cycle of pre-primary education. What materials would you recommend for tiflotechnology and what benefits could they provide him/her?

Send us your adaptation proposal through the e-learning platform, and the partner entities and experts of the tutoring team will evaluate, correct, and help you in the adaptation.

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PDF - BENEFITS OF THE INCLUSION OF STUDENTS WITH S.E.N.

Although the many existing investigations cannot yet establish generalized results, there is no true evidence that the results obtained by separating students with SEN in segregated contexts are better than those obtained in integrated classrooms; however, it seems a consistent reality that the high quality in the design of the programs is a guarantee of successful integration or inclusion.

The education of students with SEN in inclusive educational environments provides obvious benefits to both these students and the educational environment itself, and these same benefits can be seen from the point of view of students with SEN and from the perspective of those who do not have them. The reasons that boost inclusion can be determined as follows (McGregor & Vogelsberg, 1998):

For students with SEN:

- Children with disabilities show higher levels of social interaction with peers who do not have SEN when comparing inclusive to segregated environments.
- The skills related to the social and communicative competence of children with functional diversity correlate positively with inclusive environments, undoubtedly due to the greater frequency and quality in the situations of communication between equals that inclusive environments provide.
- Children with disabilities in inclusive environments often have more rigorous curricular schedules than the rest of their peers, which favors the improvement of the acquisition of skills and academic contents.
- The social acceptance of children with functional diversity is favored by the frequent situations of work in small groups that naturally happen in inclusive classrooms.
- More frequently in inclusive environments, situations of friendship are generated between students with disabilities and those without, showing that the networks of friendship generated in situations of inclusion are more durable than others.

For students without SEN:

- The development of students without SEN is not compromised with the presence of students with them in their classroom.
- There are no works in educational literature that support that classrooms with students with different abilities hinder the learning process.
- All the students in an inclusive classroom can benefit from the specific educational technologies implemented to adjust the educational response given to the students, and can also use them when they are not being used by the students that need them.
- Students without SEN can benefit from the extraordinary endowments, both material and personal, that can be made in inclusive classrooms.
- The curriculum of these classrooms can be enriched with extraordinary contents like Braille or Sign Language.
- Students taught in inclusive classrooms value diversity, from the consideration and respect for all people, as a quality of human groups.

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Looking out for a School for All

"The main objective of VisAPP is to serve as an ICT tool to promote the inclusion of children with visual impairment in pre-primary education."

- ***School For All*** Project

INTRODUCTION

The purpose of the project "*Looking out for a School for All*", developed within the framework of the Erasmus Plus Programme, is to facilitate the social and educational inclusion of students with visual impairment in the earliest stages of school education, especially during pre-primary education and the first years of primary education. This project is based on the needs identified in the field of pre-primary education, providing learning procedures, tools, and materials to adapt education at these early ages to children with visual disabilities, which is essential to ensure their full educational inclusion. This is why this project aims to develop materials and tools that facilitate the inclusion of children with visual disabilities in early education by designing applications adapted to their learning, plus digital training materials for teachers in both formal and non-formal education.

Among the various results that have been developed in the project, the two Intellectual Outputs should be highlighted:

- O1: VIRTUAL TRAINING COURSE FOR THE TRAINING OF TEACHERS AND PRE-PRIMARY EDUCATION CENTERS IN THE INCLUSION OF STUDENTS WITH VISUAL IMPAIRMENT IN THEIR CLASSROOMS.
- O2: ORIGINAL ICT TOOL FOR THE INCLUSION OF STUDENTS WITH VISUAL IMPAIRMENT IN THE CLASSROOM.

Consequently, the objective of this guide is to serve as a support to O2, to offer a methodological proposal that facilitates the work of this game in the classroom and its use aimed at the sensory-perceptual development of the child and the stimulation of creativity through visual and auditory stimulation. As an interdisciplinary pedagogical tool, it aims to become a support resource to work, along with the students, to improve and stimulate cognitive development and to promote group work and socialization among students on an equal footing regardless of their barriers.

The use of ICTs (in this case an application) in the classroom as another resource becomes an easy task due to the interest it sparks in students, but as teachers we need to be prepared to work on the educational aspects of the game that need our intervention, and that the student would hardly reach alone at such early ages, since visual stimulation is an exercise that must be supervised and scheduled.

VISApp has been developed thanks to the combined work of 6 European entities (REDTREE MAKING PROJECTS - Spain, ALBA - Spain, ANIRIDIA EUROPE - Europe, ANIRIDIA NORGE - Norway, SMALLCODES - Italy, and ANIRIDIA ITALIANA - Italy), along with expert pedagogues, doctors, scientists, teachers, and the families of children with low vision. Each of the games in the App has been created from intense work carried out for more than 2 years, considering each and every aspect so they properly adapt to the characteristics and needs of these young users. From the ranges of color used (the color palette can be modified according to the specific characteristics of the low vision student) to the difficulty of the game (to adapt it to the skill level of the children), through the design of all its contents with methods that have been scientifically proven to be the most suitable for children with low vision, but that pedagogues and teachers have also confirmed to draw their attention.

However, following the recommendations of the specialists, we advise that the use of this App should never be the only activity aimed at visual stimulation, that is not used for more time than recommended, and it is always used under the supervision of professionals, parents, or tutors.

5.1 VISUAL STIMULATION APPLICATION

One of the biggest challenges in the early years of life is developing both hand-eye coordination and logical thinking; babies use their eyes and hands separately. During their first months of life, looking at an object and touching it are separate actions in the child's mind, from 3 months on they must learn to coordinate their eyes and hands, becoming active participants in what happens around them.

Enhancing the awareness of the visual stimulus -in any case of children with visual remain- makes children improve their sense of achievement and their learning, and will contribute to their success with future skills that require the control of their hands, their visual memory, and logical thinking.

Their first steps are facilitated by vision and their spatial awareness, since going out to an unfamiliar environment (such as the pre-primary school) requires their visual skills working at full capacity. The type of game appropriate for this stage should accelerate their senses and learning, contributing decisively to improve their future autonomy in various activities like sports, music training, and basically everything that requires physical interaction.

Once their observation capability is developed, we must next introduce "logical thinking". Games of logic create ideal environments to stimulate curiosity and investigation, while continuing to increase both their abilities and their visual memory, providing agility to solve problems.

Thus, in the different games of the ICT tool developed in this project, we have combined the three phases in which stimulation occurs:

- **Seriation**: showing series of objects and colors that must be completed by applying mathematical logic and observation.
- **Correspondence**: the child is able to identify different sets of objects through this notion and generate new sets through the combination of previous ones.

- **Classification**: by classifying groups of objects with common characteristics, the child will develop the ability to classify, distribute, and order, and we can also develop their logic when they think -through observation and correspondence- which object logically follows in a series.

There are many useful ICT resources specifically designed to help people with visual disabilities, but most of them are not focused on users of such an early age, nor are they especially designed as an educational resource. We must also not forget that visual stimulation is an exercise that must be supervised and programmed individually by both professionals and parents or guardians.

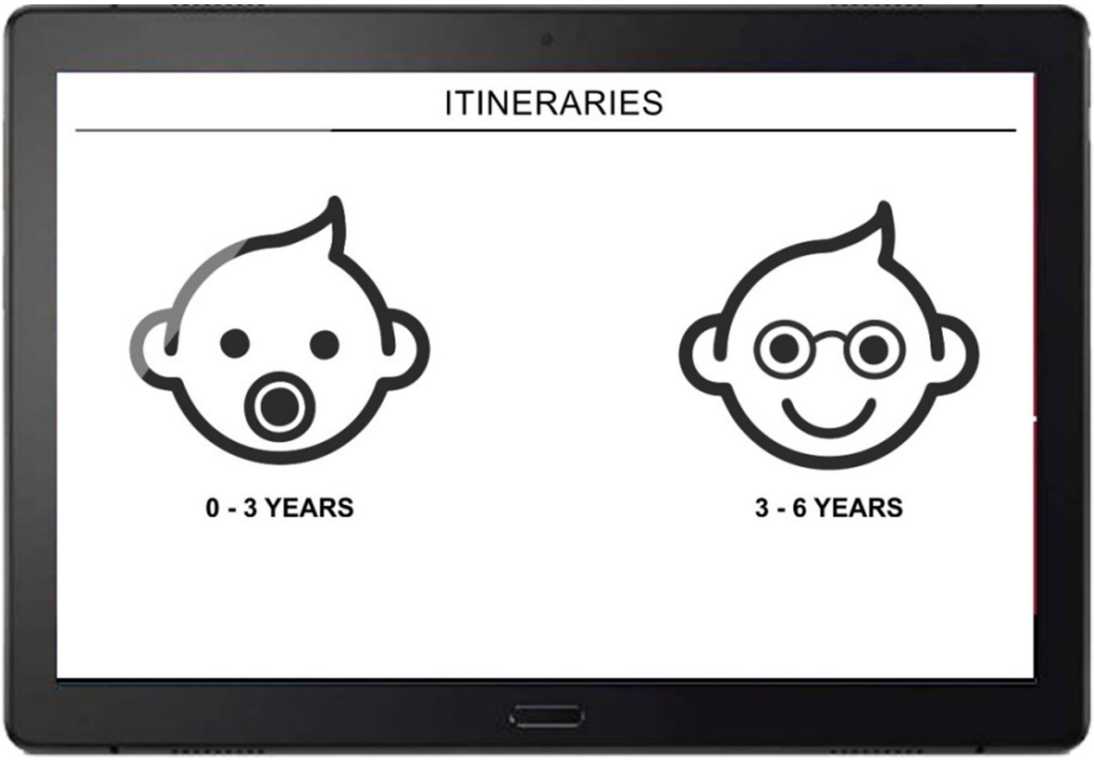
Bearing in mind this analysis and the importance of early stimulation, we proposed the design of this App that includes all the necessary adaptations to create a pedagogical tool that follows a sequence of visual experiences aimed at seeking the improvement in the functioning vision of children from 0 to 6 years old with low vision.

5.2 OBJECTIVES AND CHARACTERISTICS OF VISAPP

VISApp has been developed as a response to the need of creating a new and unique ICT tool that provides solutions for teachers to promote the effective inclusion of children with mild to severe visual impairment in pre-primary classrooms, the main objective of the App being to serve as support material for the visual and cognitive stimulation of children from 0 to 6 years old with visual disabilities.

However, the use of this App is not exclusive intended for students with SEN (special educational needs); we have also conceived it as a mechanism for inclusion in equity, so it is a resource to be used by the entire classroom, promoting -in addition to the sensory-perceptual development of children with low vision and the stimulation of their creativity- group work and socialization among all students through collaborative work.

It is structured as a progressive learning system, and its contents (games) are divided into two blocks or learning itineraries, by age and objectives to be achieved. Six games have been designed for each of the itineraries, for a total of 12 games in which several skills are worked on and trained: intentionality, hand-eye, hand-ear and bimanual coordination, spatial orientation, reasoning, laterality, systematic search, cause-effect relations, permanence, object classification, assigning actions and qualities to objects, learning spatial and abstract concepts, imitation and production of sounds and words, memory, attention, and auditory and visual differentiation skills.Although there is a recommended age for each game these age groups are for guidance only and are not necessary to follow as long as the child is able to carry out the activity.



5.2.1 VISAPP ICONS

Depending on the itinerary, the difficulty, and the contents of each game, they will have the following icons:

INTERACTIVITY ICONS

- **WATCH**: this icon implies that the user just has to watch what is being shown in the screen. There is no interaction with the hand.
- **TOUCH**: this icon implies that the user should touch the icons or shapes shown in the screen.
- **DRAG**: this icon shows that the user should touch and drag with the finger.

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GAME ICONS

INDIVIDUAL

IN A GROUP

- **INDIVIDUAL:** the game can be played individually, just by one child.
- **IN A GROUP:** the game can be played in pairs or in a group.

AREA ICONS

TUTOR

USER

- **TUTOR:** this icon means that the accesses linked belong to the tutor area. They are informative contents and training tools created for family members and professionals (user guide, games info, session programming…).
- **USER:** this icon means that the accesses linked belong to the user area, which comprises the two educational itineraries designed for the two cycles of pre-primary education: 0-3 and 3-6 years old.

ITINERARY ICONS

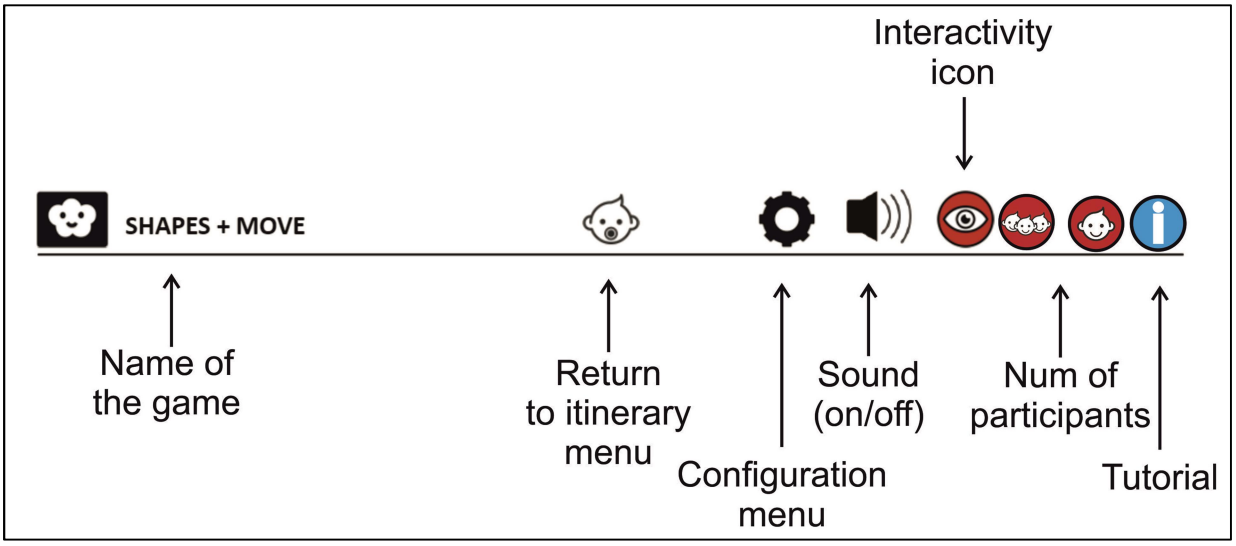
0 - 3

3 – 6

- **0 to 3 years old**: the game belongs to the itinerary from 0 to 3 years old, matching the first cycle of pre-primary education.
- **3 to 6 years old**: the game belongs to the itinerary from 3 to 6 years old, matching the second cycle of pre-primary education.

5.2.2 TOOLBAR

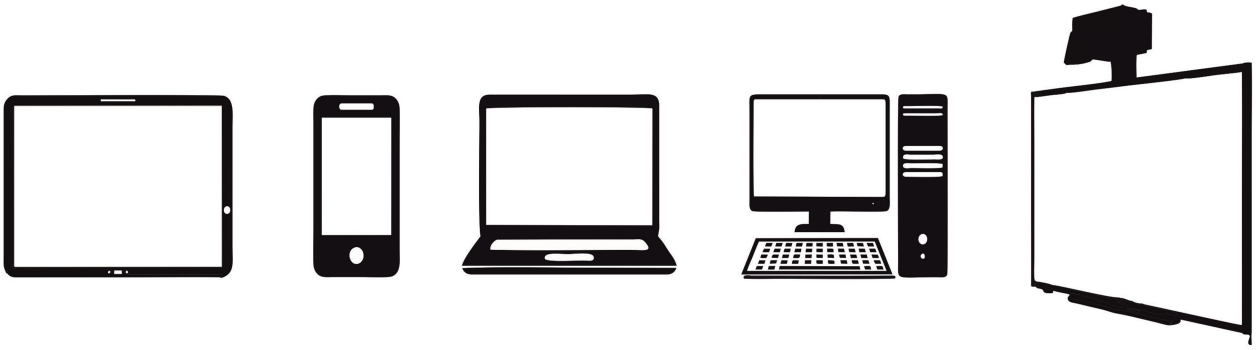
When selecting one of the two itineraries, a toolbar will appear at the top of the screen, providing access to various settings and controls; it shows:



Once the game has been selected, the information/tutorial icon will provide a description and indications on how it works, the recommended methodology, criteria to be evaluated, and the curricular objectives developed for it. Each game also has a configuration panel to regulate its characteristics according to the student's needs (shapes, background, color palettes, sound, and level).

5.2.3 DEVICES THAT SUPPORT VISAPP

VISApp is an interactive application specially designed for use by teachers at school and families at home, which is why we have devised it to be supported by many devices.



TABLET **SMARTPHONE** **LAPTOP** **PC** **E-BOARD**

5.2.4 HOW TO DOWLOAD AND INSTALL VISAPP

VISApp is easy to download in the Android environment (via PlayStore) and is compatible with the iOS operating environment (via its online version on the schoolforall.eu website), and is very accessible through the internet and social networks.

ACCESS IN ANDROID DEVICES:

1. Open PlayStore in your device.
2. Look for "VISApp" with the search bar.
3. Click on "install".
4. Once installed, just look for the VISApp logo.

ACCESS IN iOS DEVICES:

1. Access www.schoolforall.eu from your device.
2. Access the section "resources" or the section VISApp.
3. Click on the icon for iOS devices.
4. Open the online version, and if you want create a direct access from your desktop.

INSTALL IN iOS, MAC, PC, OR LINUX DEVICES:

1. Access www.schoolforall.eu from your device.
2. Access the section "resources" or the section VISApp.
3. Click on the icon matching your device of choice.
4. Choose a download route (it will go to "downloads" by default).
5. Open the file nw.exe (you can also create a direct access from your desktop).

ONLINE VERSION:

Just access the online version of the App from www.schoolforall.eu or from the account of the project in social networks (Facebook, Twitter, and Instagram).

5.2.5 USING VISAPP

Now we will show you the environment and a tour through your first access to VISApp:

1. Click on the VISApp icon in your device to access.

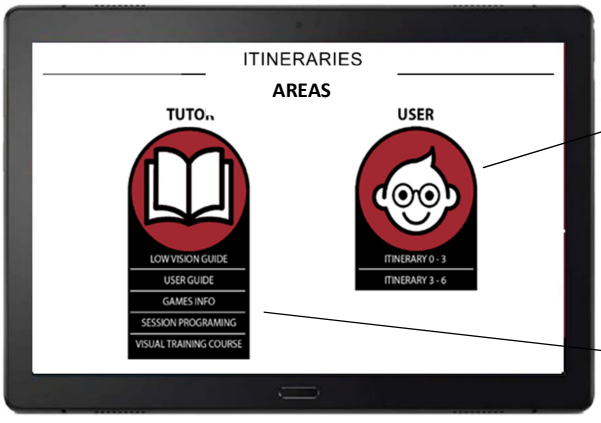
2. Once the program has started, it will show you the front page and introductory pages.

3. After the tutorial or if you click on "start", you will go to the initial selection screen.

Access the tutorial, with recommendations of use, an explanation of the toolbar, features, and a glossary for the different icons. After the full tutorial you will arrive to the educational itinerary selection screen.

Direct access to the educational itinerary selection screen:
- From 0 to 3 years old.
- From 3 to 6 years old.

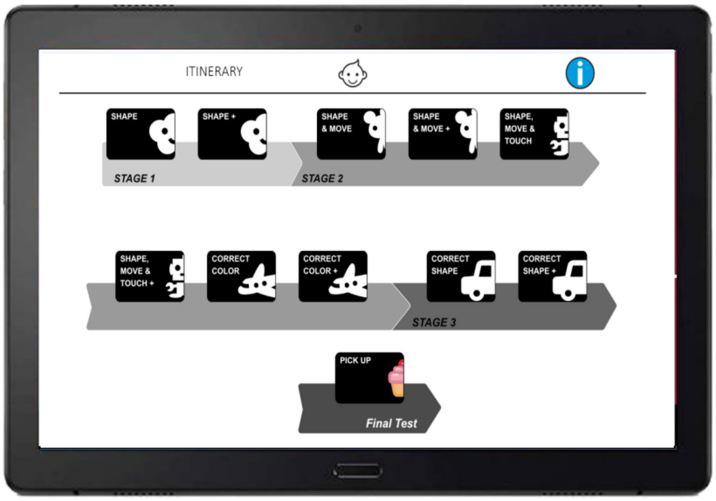
4. Accessing directly from the previous page, or from the tutorial, finally the user will arrive at the selection screen of the two educational itineraries offered by VISApp:



The user area gives access to visual stimulation educational itineraries designed for the two cycles of pre-primary education (0 to 3 and 3 to 6 years old).

The tutor area gives access to information and learning tools for professionals and families (user guide, session scheduling, games info, etc.).

5. By selecting any of the itineraries, you will access the screen where you can find the suggested educational games for each of the infant education cycles. These games are adapted to the curricular requirements and favor inclusion through the development and socialization of children with low vision.



Each itinerary has 11 educational games, structured by difficulty and in three stages. The last game allows to evaluate and perfect the skills developed throughout the previous ones. Just touch or click on the icon of a game to open it.

6. Each of the different access buttons in the tutor area will take you to each of the files, links, or screens with information or training materials.

- LOW VISION: information on two genetic disorders linked to low vision: Albinism and Aniridia.
- USER'S GUIDE: the full user guide to support the APP, offering a methodological proposal that facilitates the work with this multimedia tool in the classroom and its use.
- GAMES INFO: sheets for each of the games with basic information on its level, objective, preparation, configuration, evaluation criteria, and curricular objectives to be developed.
- SESSION PROGRAMMING: information and recommendations made by experts from the project's partner entities on how to schedule sessions.
- VIRTUAL TRAINING COURSE: access to the virtual platform containing the course for teachers of pre-primary education for the inclusion of children with low vision in ordinary classrooms.


TWO GENETIC DISORDERS LINKED TO LOW VISION
WHAT IS ALBINISM?
WHAT IS ANIRIDIA?
LEVEL OF THE GAME:
OBJECTIVE OF THE GAME:
SETTING FOR THE ACTIVITY:
COLOR CONFIGURATION FOR THE GAME:
ALBINISM
ANIRIDIA
WORKING METHODOLOGY:
SHAPES
PROGRAMMING / SESSIONS
TUTOR
LOW VISION GUIDE
USER GUIDE
GAMES INFO
SESSION PROGRAMING
VISUAL TRAINING COURSE
EARLY STIMULATION PROGRAM
USER'S GUIDE
FREE
COURSE FOR NURSERY SCHOOL TEACHERS

5.3 DESCRIPTION OF THE GAMES

0 to 3 years old

ITINERARY 1

SHAPES and SHAPES+

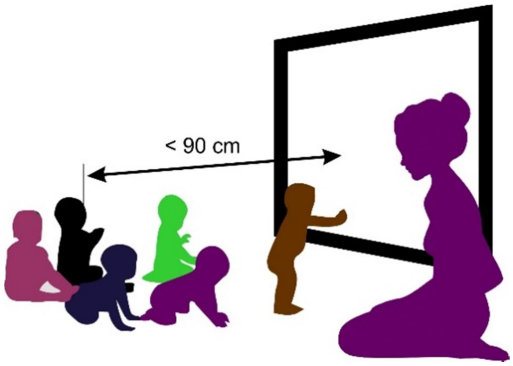
LEVEL OF THE GAMES: Easy, intended for the first level of the first cycle of pre-primary education.

OBJETIVE OF THE GAMES: Attracting the attention of the child and both his/her visual and hearing stimulation.

SETTING FOR THE ACTIVITY: The games can be played individually or in a group:

- In the case of individual work with the student, we recommend to use a tablet. The teacher should hold the child and carry out the activity with the teacher holding the device and analyzing their reactions. Place the device upright, 20 to 30cm before the child. Classroom lighting should be dim.

- If the game is played in a group, we recommend using a digital whiteboard or projector, placed closest to the ground, so it enters the natural field of vision of the child. The maximum distance for a 150cm wide device should always be less than 90cm (considering the visual capabilities of students with ~10% of vision). You can also use a tablet but reducing the distance according to individual use. Classroom lighting should be dim.



WORKING METHODOLOGY: this is a basic game without active interactivity. Establish a table of daily exercises from the start, combining the shapes, colors, and background

according to both the required needs of the students and the objectives to be achieved. As stated before, it is strongly advised to especially analyze the child's reactions.

If the game is played in a group, place the students around the board but without forcing them to pay attention. All children with visual limitations should be within 90cm or closer to the device. Once the activity begins, notice the children who look at the screen and the reactions they have.
In both cases, a relaxed and calm environment with dim lighting is recommended.
The exercise should last between 3 and 5 minutes, 2 or 3 times a day.

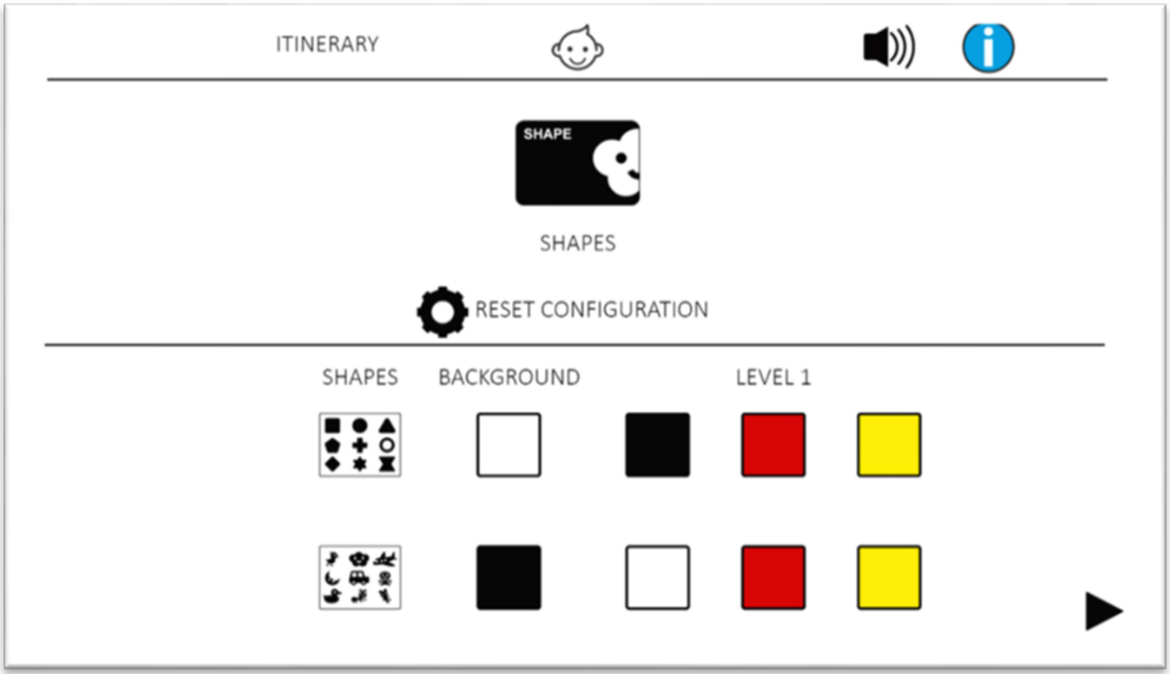
CONFIGURATION OF THE GAMES: configure the game regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development. For the initial stages we recommend:

- Children with Aniridia (or a visual impairment with similar characteristics): black background and yellow shapes.
- Children with Albinism (or a visual impairment with similar characteristics): black background and white or red shapes.

Once satisfactory results are obtained, you can try other configurations.

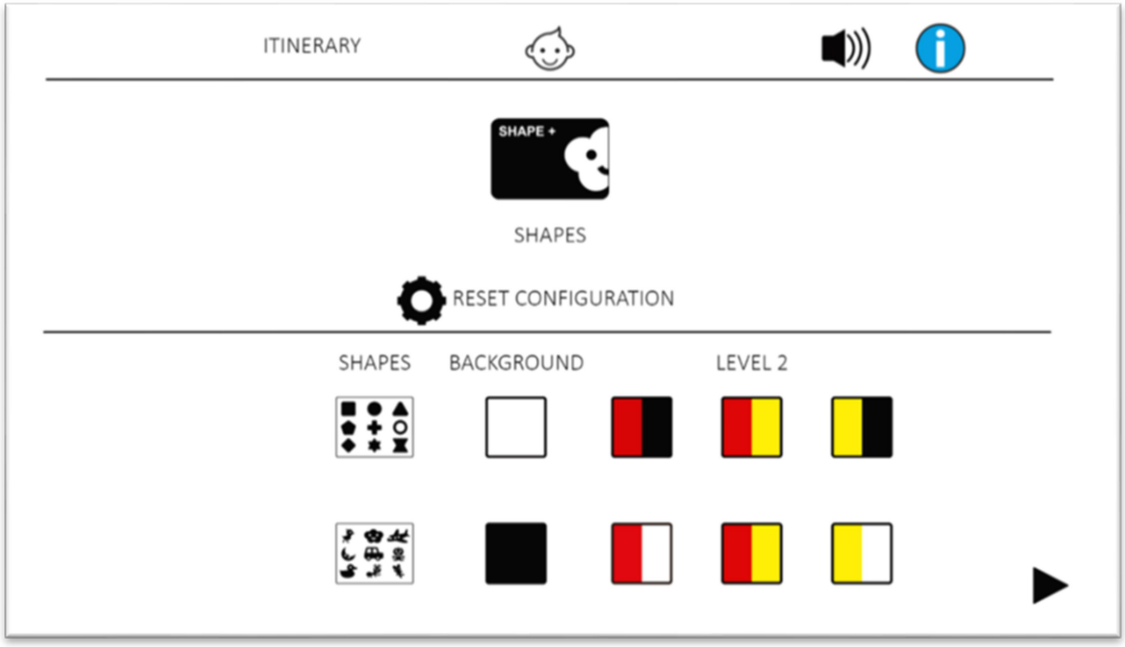
The configuration panel for **SHAPES** is divided into 3 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background.
- **Colors**: there are 3 colors to choose from, depending on the selected background.



The configuration panel for **SHAPES+** is divided into 3 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background.
- **Colors**: the selected shapes will appear randomly combined in a combination of two colors. There are 3 possibilities 2-color combinations for each background.



HOW DOES IT WORK: the chosen shapes will appear in the center of the screen at random. Test the level of attention of the child or children both with and without music, and progressively enhance the configurations in which you don't get the desired results, until a higher level of attention is obtained.

CRITERIA TO EVALUATE: these are games designed to evaluate the ability of both students with and without low vision to perceive shapes and colors. Thus:

- Notice if the child detects the shapes in the screen by looking at his/her reactions to it.
- Are there specific shapes and colors that are easier to follow by the child and start reactions in him/her? Which are they?
- Notice, if the child detects the shape, if he/she aims his/her gaze perpendicularly or obliquely to it.
- In individual use, strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security with the latter.
- For group use, analyze if there are interactions between the children and if they reinforce group play around the shape shown.

CURRICULAR OBJECTIVES DEVELOPED: these games enable the development of the objectives established in the curricula of pre-primary schools in the partner countries:

1. The child actively participates in different kind of games.
2. The child adapts his/her posture to different games and situations.
3. The child enjoys group games.
4. The child shows mutual collaboration and helping attitudes towards his/her peers in daily activities.
5. The child shows collaboration attitudes towards adults in daily activities.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

SHAPES&MOVE and SHAPES&MOVE+

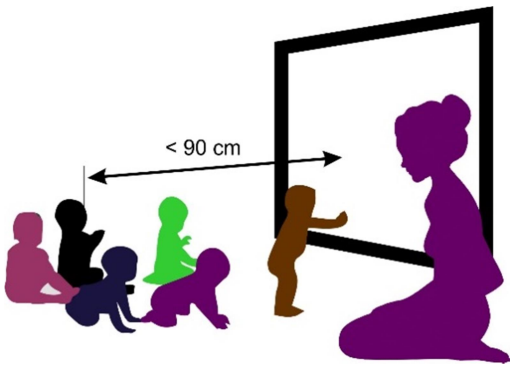
LEVEL OF THE GAMES: Easy, intended for the first or second level of the first cycle of pre-primary education.

OBJETIVE OF THE GAMES: Attracting the attention of the child and that he/she follows the shape with his/her gaze.

SETTING FOR THE ACTIVITY: Both games can be played individually or in a group:

- In the case of individual work with the student, we recommend to use a tablet. The teacher should hold the child and carry out the activity with the teacher holding the device and analyzing their reactions. Place the device upright, 20 to 30cm before the child. Classroom lighting should be dim.

- If the game is played in a group, we recommend using a digital whiteboard or projector, placed closest to the ground, so it enters the natural field of vision of the child. The maximum distance for a 150cm wide device should always be less than 90cm (considering the visual capabilities of students with ~10% of vision). You can also use a tablet but reducing the distance according to individual use. Classroom lighting should be dim.



WORKING METHODOLOGY: establish a table of daily exercises from the start, combining the shapes, colors, and background according to both the required needs of the students and

the objectives to be achieved. In this case, it is important that the child or children follow the shape either with their eyes or moving their head. In the case of individual work, and if the baby is already able to stay seated, we recommend to do the activity in this position, with the screen always upright.

When played in a group, place the students around the board but without forcing them to pay attention. All children with visual limitations should be within 90cm or closer to the device. Once the activity begins, notice the children who look at the screen and the reactions they have.

In both cases, a relaxed and calm environment with dim lighting is recommended.

Tests the level of attention and following of the shape both with music and without it, and progressively enhance the configurations that do not show the desired results until a higher level of attention is obtained.

The exercise should last between 5 and 7 minutes, 2 or 3 times a day.

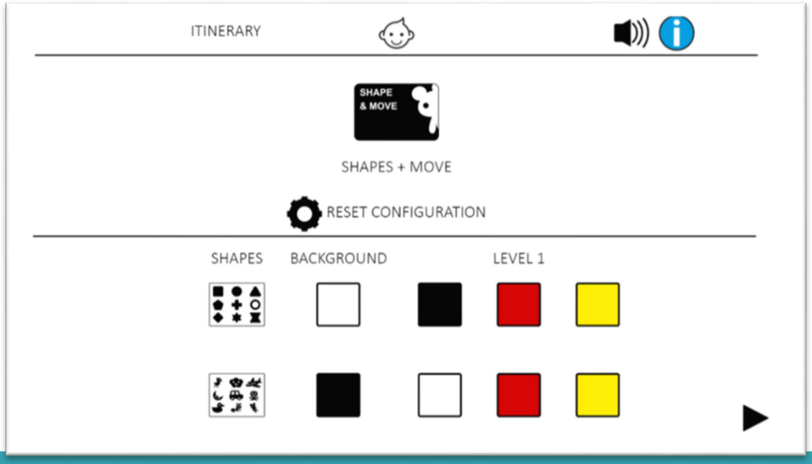
CONFIGURATION FOR THE GAMES: configure the games regarding the shapes shown, their colors, and background depending on the needs of the student and his/her stage of development. For the initial stages we recommend:

- Children with Aniridia (or a visual impairment with similar characteristics): black background and yellow shapes.
- Children with Albinism (or a visual impairment with similar characteristics): black background and white or red shapes.

Once satisfactory results are obtained, you can try other configurations.

The configuration panel for **SHAPES&MOVE** divided into 3 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background.
- **Colors**: there are 3 colors to choose from, depending on the selected background.



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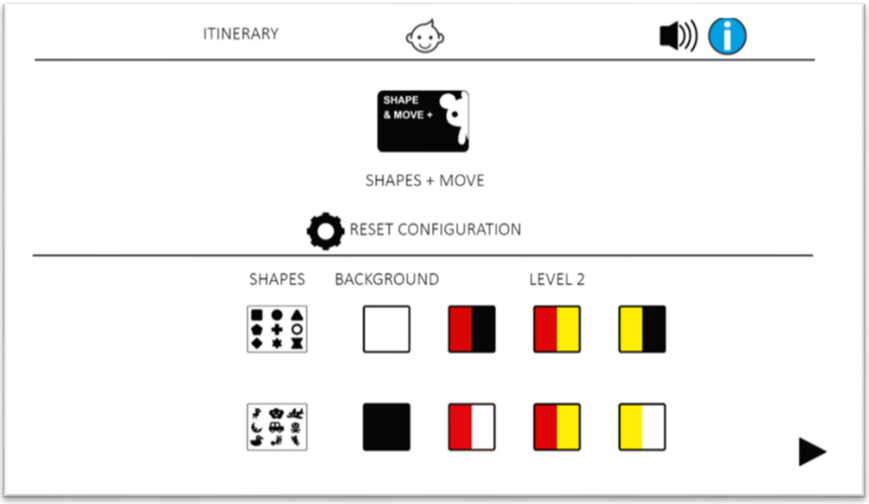
The configuration panel for **SHAPES&MOVE** divided into 3 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background.
- **Colors**: the selected shapes will appear randomly combined in a combination of two colors. There are 3 possibilities 2-color combinations for each background.



HOW DOES IT WORK: the chosen shapes will appear randomly, moving both horizontally and vertically. The selection of the shapes is important to detect possible problems and to enhance the monitoring capability of the students, especially those with low vision.

CRITERIA TO EVALUATE: these are games designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- Notice if the child is able to follow the moving shape in the screen by his/her head and eye movements.
- Are there specific shapes and colors that are easier to follow by the child and start reactions in him/her? Which are they?
- Notice, if the child detects the shape, if he/she aims his/her gaze perpendicularly or obliquely to it.
- In individual use, strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security with the latter.
- For group use, analyze if there are interactions between the children and they reinforce group play around the shape shown.

CURRICULAR OBJECTIVES DEVELOPED: these games enable the development of the objectives established in the curricula of pre-primary schools in the partner countries:

1. The child actively participates in different kinds of games.
2. The child shows coordinated motor abilities.
3. The child knows the basic notions of orientation worked on.
4. The child adapts his/her posture to different games and situations.
5. The child enjoys group games he child shows mutual collaboration and helping attitudes towards his/her peers in daily activities.
6. The child shows collaboration attitudes towards adults in daily activities.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

SHAPES&MOVE&TOUCH and SHAPES&MOVE&TOUCH+

LEVEL OF THE GAMES: Medium, intended for the second level of the first cycle of pre-primary education.

OBJETIVE OF THE GAMES: sparking the reaction of following the shape and trying to touch it.

SETTING FOR THE ACTIVITY: The games can be played individually or in a group:

- In the case of individual work with the student, we recommend to use a tablet. Place the device upright, 20 to 30cm before the child. Classroom lighting should be dim.

- If the game is played in a group, we recommend using a digital whiteboard or projector, placed closest to the ground, so it enters the natural field of vision of the child. Children must be in contact with the device and be able to cover a large part of its area. You can also use a tablet but reducing the distance according to individual use. Classroom lighting should be dim.

WORKING METHODOLOGY: establish a table of daily exercises from the start, combining the shapes, colors, and background according to both the required needs of the students and the objectives to be achieved. In this case, it is important that the child or children follow the shape either with their eyes or moving their head. In the case of individual work, and if the

baby is already able to stay seated, we recommend to do the activity in this position, with the screen always upright.

If the work is in a group, it is recommended to make groups of maximum 3-4 children. All students will be placed in contact with the device. Once the activity begins, notice the children who look at the screen and the reactions they have.

In both cases, a relaxed and calm environment with dim lighting is recommended.

Test both attention and interaction, both with and without music. Progressively enhance the configurations that do not show the desired results until a higher level of interactivity is obtained.

The exercise should last approximately for 15 minutes, 2 or 3 times a day.

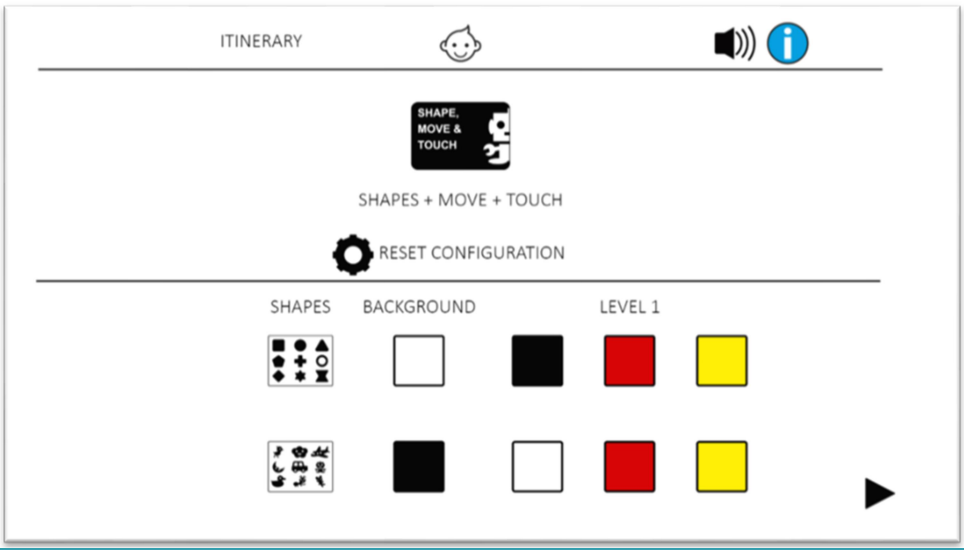
CONFIGURATION FOR THE GAMES: configure the games regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development. For the initial stages we recommend:

- Children with Aniridia (or a visual impairment with similar characteristics): black background and yellow shapes.
- Children with Albinism (or a visual impairment with similar characteristics): black background and white or red shapes.

Once satisfactory results are obtained, you can try other configurations.

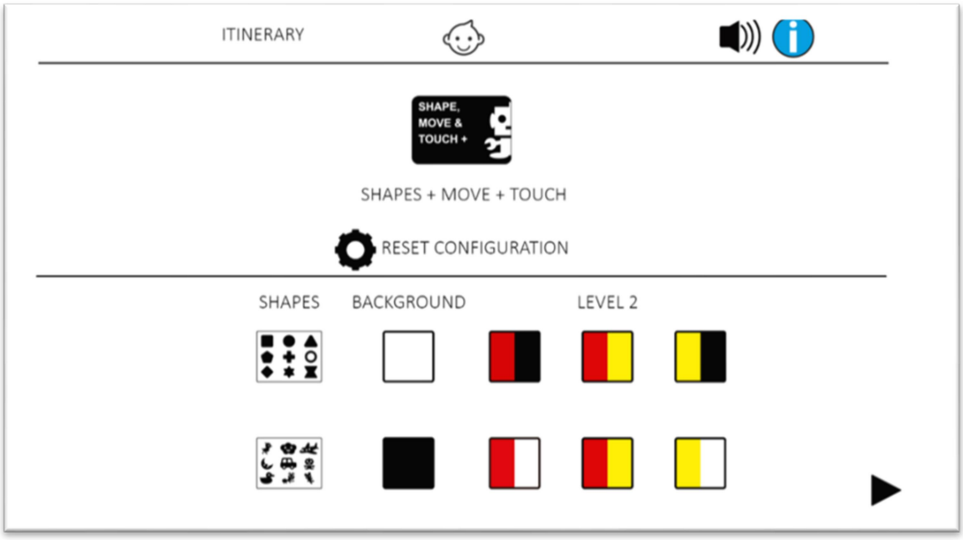
The configuration panel for **SHAPES&MOVE&TOUCH** is divided into 3 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background.
- **Colors**: there are 3 colors to choose from, depending on the selected background.



The configuration panel for **SHAPES&MOVE&TOUCH+** is divided into 3 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background.
- **Colors**: the selected shapes will appear randomly combined in a combination of two colors. There are 3 possibilities 2-color combinations for each background.



HOW DOES IT WORK: the chosen shapes will move randomly through the screen, both horizontally and vertically. By touching any part of the screen twice, the shape will stop and appear in a larger size in the center of the screen with a sound that will indicate success; the game resumes 2 seconds later.

CRITERIA TO EVALUATE: these are games designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- Notice if the child is able to follow the moving shape in the screen by his/her head and eye movements.
- Are there specific shapes and colors that are easier to follow by the child and start reactions in him/her? Which are they?
- Notice, if the child detects the shape, if he/she aims his/her gaze perpendicularly or obliquely to it.
- In individual use, strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security with the latter.
- For group use, analyze if there are interactions between the children and they reinforce group play around the shape shown.

CURRICULAR OBJECTIVES DEVELOPED: these games enable the development of the objectives established in the curricula of pre-primary schools in the partner countries:

1. The child starts discovering laterality in their body.
2. The child uses the motor, sensitive, and expressive possibilities of their body globally.
3. The child actively participates in different kinds of games.
4. The child shows coordinated motor abilities.
5. The child shows fine handling skills.
6. The child shows interest in learning new handling skills.
7. The child knows the basic notions of orientation worked on.
8. The child adapts his/her posture to different games and situations.
9. The child shows collaboration attitudes towards adults in daily activities.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

CORRECT COLOR and CORRECT COLOR+

LEVEL OF THE GAMES: Hard; intended for the end of the first cycle of pre-primary education.

OBJECTIVE OF THE GAMES: boost logical thinking and hand-eye coordination. These games also enhance color recognition independently from shapes.

SETTING FOR THE ACTIVITY: these games are only played individually. Place the device upright, 20 to 30cm before the child. Classroom lighting should be dim. We recommend the teacher to be close to the student to strengthen their bonds of affection and to reinforce their mobility, trust, and security.

WORKING METHODOLOGY: we recommend helping the child at first to interact by teaching them to tap on the correct color by guiding their finger. This activity requires greater concentration and skill, therefore it is advisable to play together with the child, giving them confidence and security in their decisions.

Place the device within reach of the child, in line with his/her eyes. If the baby is able to seat, it is convenient to do the exercise in this position, but with the screen always upright. The activity should be carried out sitting down and with the screen resting on a table or lectern with a certain inclination if necessary.

Configure the game according to the established table and according to the child's needs, and move on when they have confidence in doing it. Test both attention and interaction, both with and without music. Progressively enhance the configurations that do not show the desired results until a higher level of interactivity is obtained.

The exercise –in its different configurations- should have a maximum length of 15 minutes, 2 or 3 times a day.

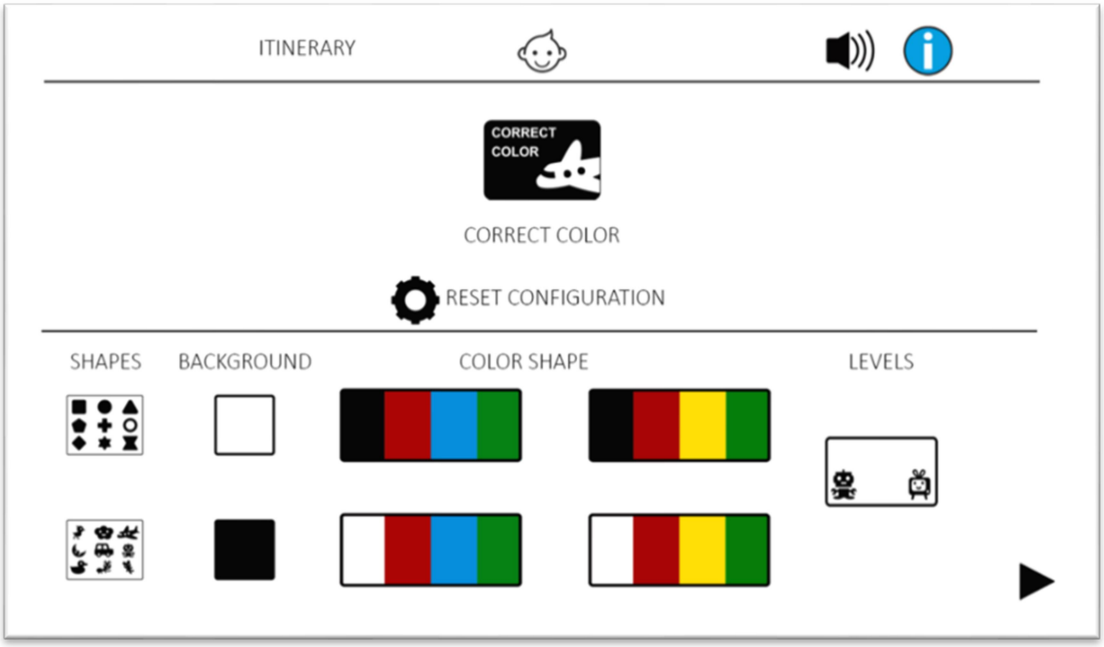
CONFIGURATION FOR THE GAMES: configure the games regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development. For the initial stages we recommend:

- Children with Aniridia (or a visual impairment with similar characteristics): black background and yellow shapes.
- Children with Albinism (or a visual impairment with similar characteristics): black background and white or red shapes.

Once satisfactory results are obtained, you can try other configurations.

The configuration panel for **CORRECT COLOR** is divided into 4 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Color of the shape**: there are 2 combinations of 4 colors for each background.
- **Level**: it has 2 shapes to choose from.



The configuration panel for **CORRECT COLOR+** is divided into 4 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Color of the shape**: there are 2 combinations of 4 colors for each background.
- **Level**: it has 3 shapes to choose from.

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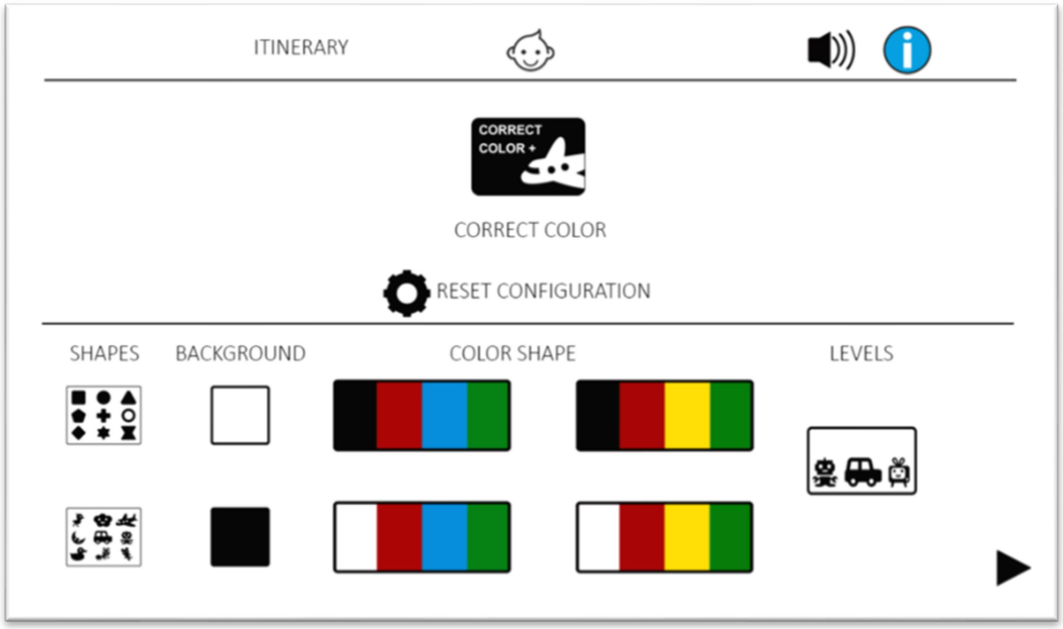


HOW DOES IT WORK: ***The games are about choosing the matching color, not the matching shape.*** A shape acting as reference model will appear randomly inside a frame in the upper center of the screen. At the bottom of the screen -and depending on the level- 2 or 3 different shapes will appear. Touch or click on the one that has the same color of the model, independently of its shape.

CRITERIA TO EVALUATE: these games are designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- Detect if the child is able to identify all shapes and in which colors.
- Are there specific shapes and colors that are easier to follow by the child and start reactions in him/her? Which are they?
- Check if the child has hand-eye coordination and is able to touch or click on the shape.
- Strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security in the latter.

CURRICULAR OBJECTIVES DEVELOPED: these games enable the development of the objectives established in the curricula of pre-primary schools in the partner countries:

1. The child starts to discover their body's laterality.
2. The child uses the motor, sensor, and expression
3. The child actively participates in different kinds of games.
4. The child shows coordinated motor abilities.
5. The child shows fine handling abilities.
6. The child shows interest in learning new handling abilities.

7. The child knows the basic notions of orientation worked on.
8. The child adapts his/her posture to different games and situations.
9. The child enjoys group games.
10. The child shows mutual collaboration and helping attitudes towards his/her peers in daily activities.
11. The child shows collaboration attitudes towards adults in daily activities.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

CORRECT SHAPE and CORRECT SHAPE+

LEVEL OF THE GAMES: Hard; intended for the end of the first cycle of pre-primary education.

OBJECTIVE OF THE GAMES: boosting logical thinking and hand-eye coordination. These games also enhance color recognition.

SETTING FOR THE ACTIVITY: these games are only played individually. Place the device upright, 20 to 30cm before the child. Classroom lighting should be dim. We recommend the teacher to be close to the student to strengthen their bonds of affection and to reinforce their mobility, trust, and security.

WORKING METHODOLOGY: we recommend helping the child at first to interact by teaching them to tap on the correct color by guiding their finger. This activity requires greater concentration and skill, therefore it is advisable to play together with the child, giving them confidence and security in their decisions.

Place the device within reach of the child, in line with his/her eyes. If the baby is able to seat, it is convenient to do the exercise in this position, but with the screen always upright. The activity should be carried out sitting down and with the screen resting on a table or lectern with a certain inclination if necessary.

Configure the game according to the established table and according to the child's needs, and move on when they have confidence in doing it. Test both attention and interaction, both with and without music. Progressively enhance the configurations that do not show the desired results until a higher level of interactivity is obtained.

The activity -in its different configurations- should have a maximum length of 15 minutes, 2 or 3 times a day.

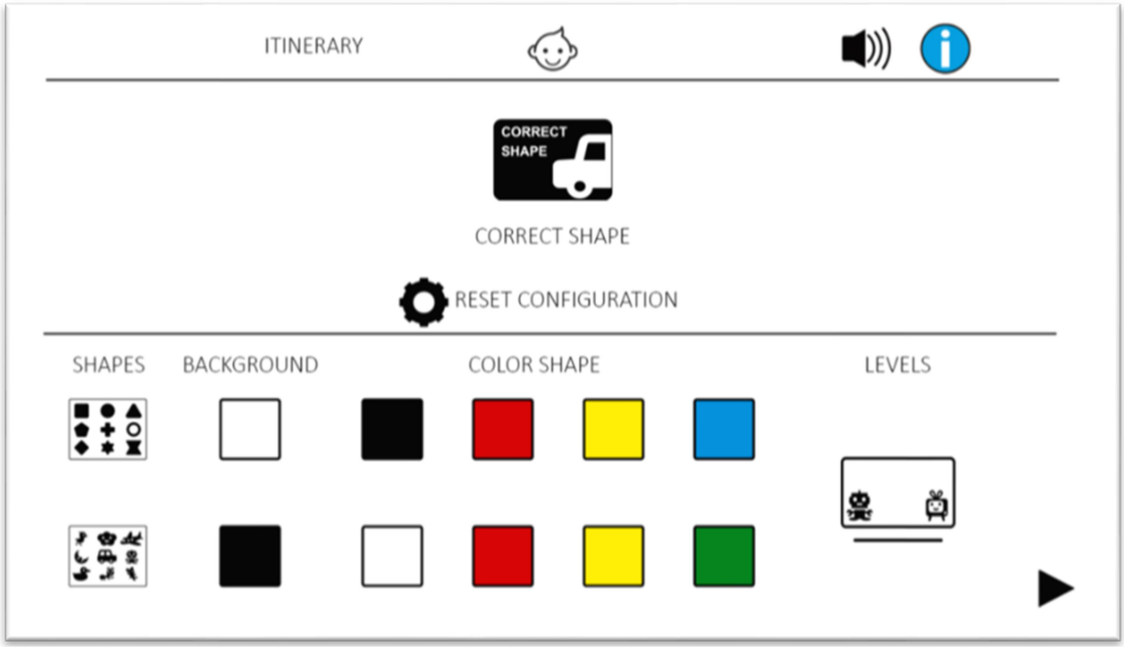
CONFIGURATION FOR THE GAMES: configure the games regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development. For the initial stages we recommend:

- Children with Aniridia (or a visual impairment with similar characteristics): black background and yellow shapes.
- Children with Albinism (or a visual impairment with similar characteristics): black background and white or red shapes.

Once satisfactory results are obtained, you can try other configurations.

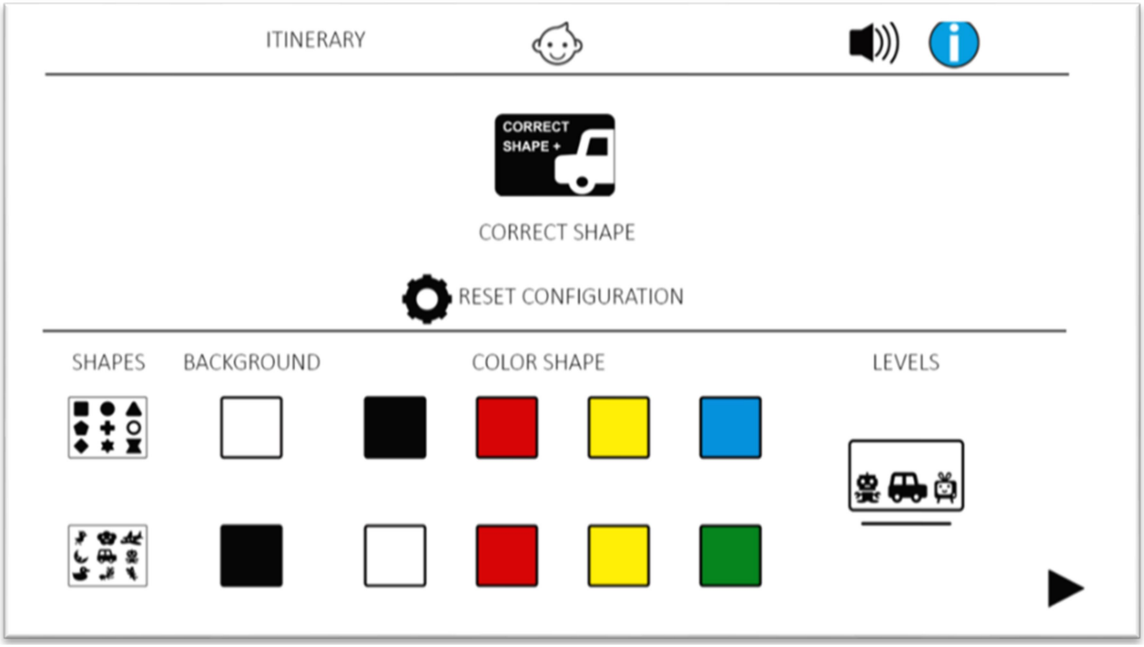
The configuration panel for **CORRECT SHAPE** is divided into 4 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Color of the shape**: there are 2 combinations of 4 colors for each background.
- **Level**: it has 2 shapes to choose from.



The configuration panel for **CORRECT SHAPE+** is divided into 4 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Color of the shape**: there are 2 combinations of 4 colors for each background.
- **Level**: it has 3 shapes to choose from.



HOW DOES IT WORK: ***The games consist in selecting the correct shape, independently of its color***. A shape of reference will appear randomly inside the frame in the upper center of the screen. 2 or 3 different shapes appear at the bottom of the screen, depending on the level chosen. Touch or click on the correct one from among them (the one that matches the reference).

CRITERIA TO EVALUATE: these are games designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- Detect if the child is able to identify all shapes and in which colors.
- Are there specific shapes and colors that are easier to follow by the child and start reactions in him/her? Which are they?
- Check if the child has hand-eye coordination and is able to touch or click on the shape.
- Strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security in the latter.

CURRICULAR OBJECTIVES DEVELOPED: these games enable the development of the objectives established in the curricula of pre-primary schools in the partner countries:

1. The child starts to discover their body's laterality.
2. The child uses the motor, sensor, and expression possibilities of their body globally.
3. The child actively participates in different kinds of games.
4. The child shows coordinated motor abilities.
5. The child shows fine handling abilities.
6. The child shows interest in learning new handling abilities.

7. The child knows the basic notions of orientation worked on.
8. The child adapts his/her posture to different games and situations.
9. The child enjoys group games.
10. The child shows mutual collaboration and helping attitudes towards his/her peers in daily activities.
11. The child shows collaboration attitudes towards adults in daily activities.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

PICK UP

LEVEL OF THE GAME: Final test, very hard; only intended for the end of the first cycle of pre-primary education.

OBJECTIVE OF THE GAME: reinforce and enhance the skills acquired in previous games. After those this one is intended to both acquire and reinforce the motor and cognitive skills of children around 3 years old.

SETTING FOR THE ACTIVITY: this game is only played individually. Place the device upright, 20 to 30cm before the child. Classroom lighting should be dim. We recommend the teacher to be close to the student to strengthen their bonds of affection and to reinforce their mobility, trust, and security.

WORKING METHODOLOGY: we recommend helping the child interact at first by showing them how to play and explaining the objective of the game while playing ourselves. This activity requires greater concentration and skill, therefore it is advisable to play together with the child, giving them confidence and security in their decisions. Once game the dynamics have been properly explained, let the child play on his/her own.

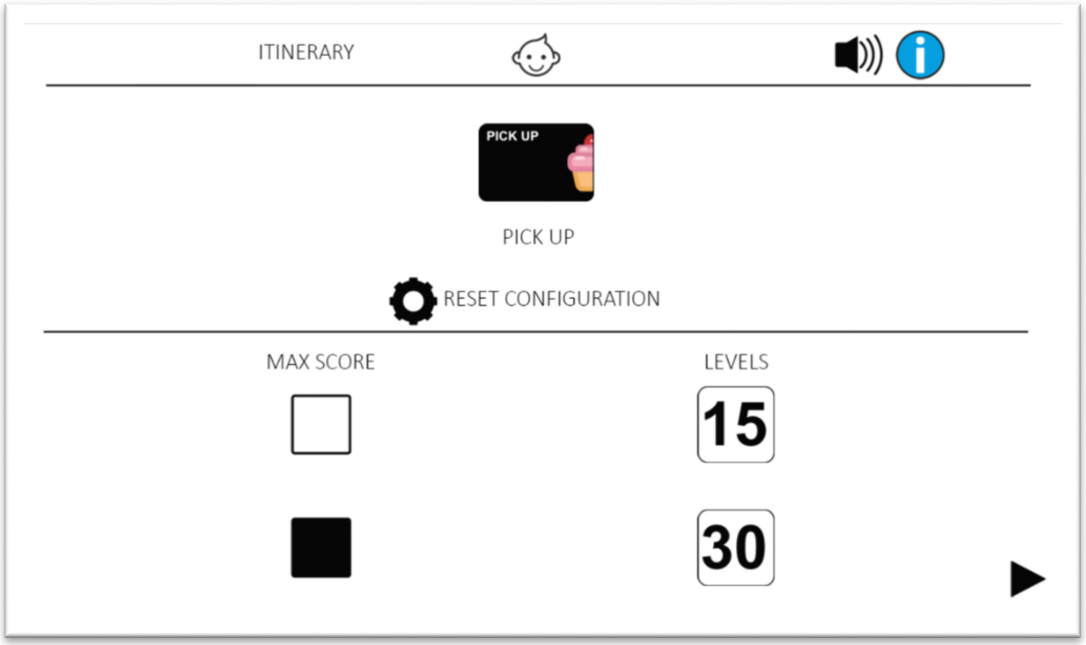
Place the device within reach of the child, in line with his/her eyes. If the baby is able to seat, it is convenient to do the exercise in this position, but with the screen always upright. The activity should be carried out sitting down and with the screen resting on a table or lectern with a certain inclination if necessary.

Configure the game according to the established table and according to the child's needs, and move on when they have confidence in doing it. Test both attention and interaction, both with and without music. Progressively enhance the configurations that do not show the desired results until a higher level of interactivity is obtained.

CONFIGURATION OF THE GAME: Configure the game both regarding the background -depending on the child's needs- and regarding difficulty levels -adjusting how many items to pick up-. Once you verify that the child carries out the activity satisfactorily, try with other configurations.

The configuration panel for **PICK UP** is divided into 2 aspects:

- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Level**: there are 2 possibilities, either 15 items to pick up, or 30.



HOW DOES IT WORK: the game consists in collecting the falling food items with the basket, while avoiding the geometric shapes. The game ends once the number of food previously selected in the settings has been collected. The basket should be moved sideways, horizontally.

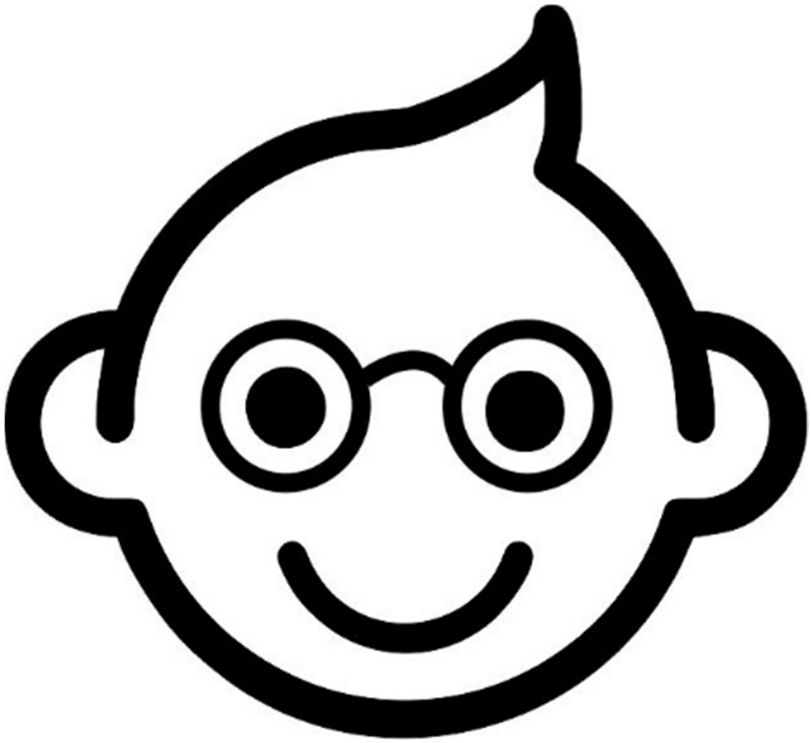
CRITERIA TO EVALUATE: this is a game designed to evaluate the skills acquired and developed throughout all previous games in this itinerary. Thus:

- Detect if the child is able to identify all shapes and in which colors.
- Are there specific shapes and colors that are easier to follow by the child and start reactions in him/her? Which are they?
- Check if the child has hand-eye coordination and is able to drag the basket under the food in time.
- Strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security with the latter.

CURRICULAR OBJECTIVES DEVELOPED: this game enables the development of the objectives established in the curricula of pre-primary schools in the partner countries:

1. The child starts to discover their body's laterality.
2. The child uses the motor, sensor, and expression possibilities of their body globally.
3. The child actively participates in different kinds of games.
4. The child shows coordinated motor abilities.
5. The child shows fine handling abilities.
6. The child shows interest in learning new handling abilities.
7. The child knows the basic notions of orientation worked on.
8. The child adapts his/her posture to different games and situations.
9. The child enjoys group games.
10. The child shows mutual collaboration and helping attitudes towards his/her peers in daily activities.
11. The child shows collaboration attitudes towards adults in daily activities.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.



3 to 6 years old

ITINERARY 2

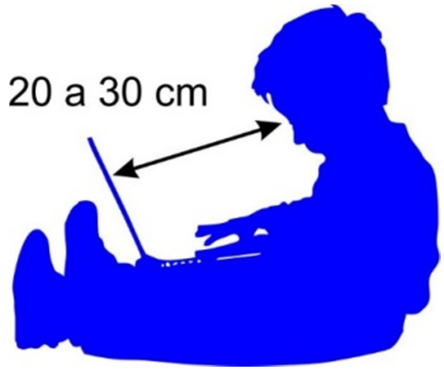
DRAG CORRECT SHAPE and DRAG CORRECT SHAPE+

LEVEL OF THE GAMES: Easy, intended for the first level of the second cycle of pre-primary education.

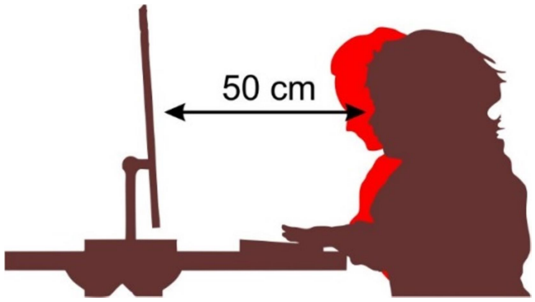
OBJECTIVE OF THE GAMES: Develop search capabilities, strengthen vision and hand-eye coordination, selecting the correct shape and color.

SETTING FOR THE ACTIVITY: these games can be played individually, in pairs (sharing a tablet), or in a group (3-4 children max.), where children should take turns getting up to select the correct shape.

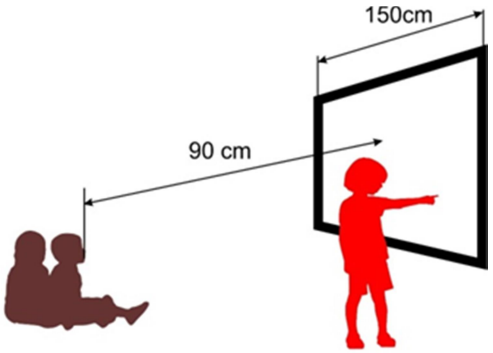
- When played individually, place the device upright, 20 to 30cm before the child. Classroom lighting should be dim.



- When played in pairs with a tablet or computer, place the device on a table at 50cm or less from each of the two children (if one of them has visual difficulties, he/she should be a little closer, similar to when playing individually).



- If the game is played in a group, we recommend using a digital whiteboard or projector, placed closest to the ground, so it enters the natural field of vision of the child. The maximum distance for a 150cm wide device should always be less than 90cm (considering the visual capabilities of students with ~10% of vision). You can also use a tablet but reducing the distance according to individual use. Classroom lighting should be dim.



WORKING METHODOLOGY: explain the child that they should drag the correct shape with their finger to the black/white frame with the shape of reference.

Time is important in this activity, so although the game does not have a time limit, we recommend you to promote some degree of speed to solve it, always with the abilities, needs, and visual conditions of the child in mind. We propose to both assign a specific time for each configuration and count the successes, and to establish a number of successes and see how long they take to be achieved.

Monitor the child's progression in the game and configure it as the proposed objectives are reached and exceeded, and the child is confident in their abilities. Progressively enhance the configurations that do not show the desired results until a higher level of interactivity is obtained.

Configure the game according to the established table and according to the child's needs, and move on when they have confidence in doing it. Test both attention and interaction, both with and without music.

The game should be played while seated, with the screen upright, in a table or a tilted lectern with if necessary. The activity -in its different configurations- should have a maximum length of 15 minutes, 2 or 3 times a day.

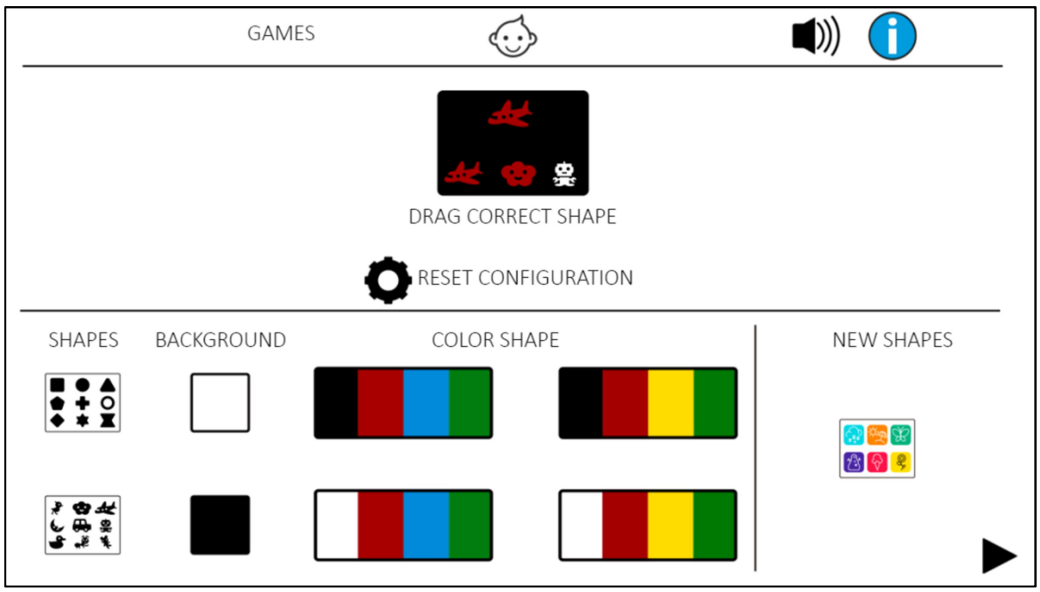
CONFIGURATION FOR THE GAMES: configure the games regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development. For the initial stages we recommend:

- Children with Aniridia (or a visual impairment with similar characteristics): black background and yellow shapes.
- Children with Albinism (or a visual impairment with similar characteristics): black background and any combination of colors for the shapes.

Once satisfactory results are obtained, you can try other configurations.

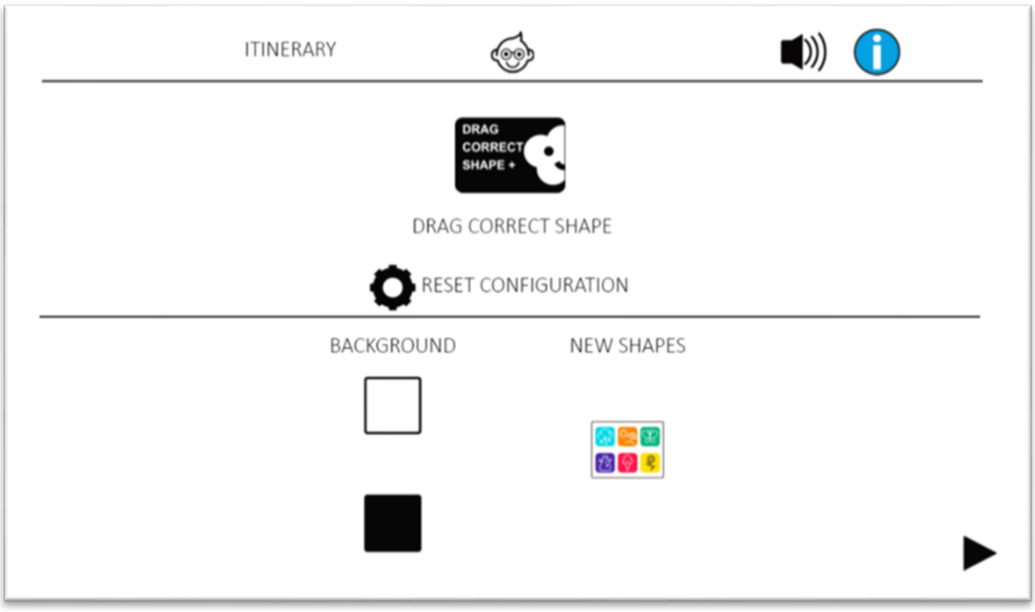
The configuration panel for **DRAG CORRECT SHAPE** is divided into 3 aspects:

- **Shapes**: there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Color of the shape**: there are 2 combinations of 4 colors for each background.



The configuration panel for **DRAG CORRECT SHAPE+** is divided into 2 aspects:

- **New shapes**: there is now the option of choosing a new set of shapes. Its design has been established to start working on linear shapes; the same drawing may appear with a different colored background.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.



HOW DOES IT WORK: the games consist in dragging the correct shape in the correct color. A random shape in a color will appear inside the frame in the upper center of the screen, as a model. At the bottom, 3 different shapes with different colors will appear, one of them matching the model in both shape and color. Touch and drag the matching shape to the model; see an icon and a sound if done correctly.

CRITERIA TO EVALUATE: these are games designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- Notice if the child is able to detect all colors and in which shapes.
- Does the child actively participate in the game and enjoy group games?
- Is the child able to follow rules and respect turn order?
- Do the children interact with their peers, both with and without disabilities?
- Do the children know how to use the e-board to access the games and activities?
- Notice if the child has hand-eye coordination and is able to touch and drag a shape on the screen.
- In individual use, strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security in the latter.

CURRICULAR OBJECTIVES DEVELOPED: these games enable the development of the objectives set in the curricula of pre-primary schools in the partner countries:

1. The child actively participates in different kinds of games.
2. The child shows coordinated motor abilities.
3. The child shows interest in learning new handling abilities.
4. The child regulates his/her expression of feelings and emotions in the game through language.
5. The child follows the rules of the game.
6. The child knows the importance of the rules of the game.
7. The child enjoys group game.
8. The child compares different images.
9. The child uses the audiovisual and technological means of the school for their enjoyment, creation, and learning.
10. The child uses educational programs to apply their acquired knowledge.
11. The child uses precise and fine body movements.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

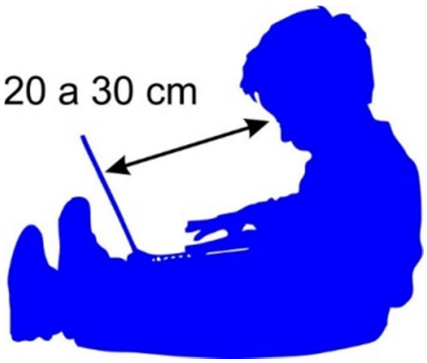
SHEARCH SHAPE and SHEARCH SHAPE+

LEVEL OF THE GAMES: Middle, intended for the second level of the second cycle of pre-primary education.

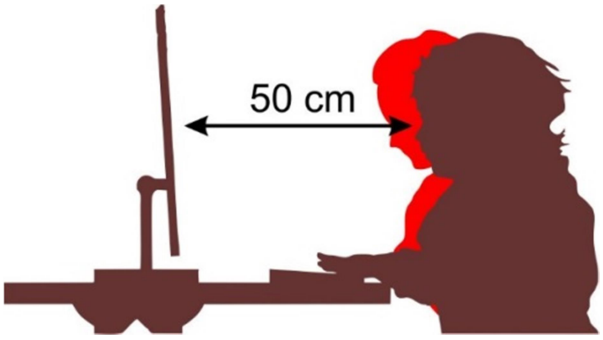
OBJECTIVE OF THE GAMES: enhancing visual perception and shape recognition.

SETTING FOR THE ACTIVITY: these games can be played individually, in pairs (sharing a tablet), or in a group (3-4 children max.), where children should take turns.

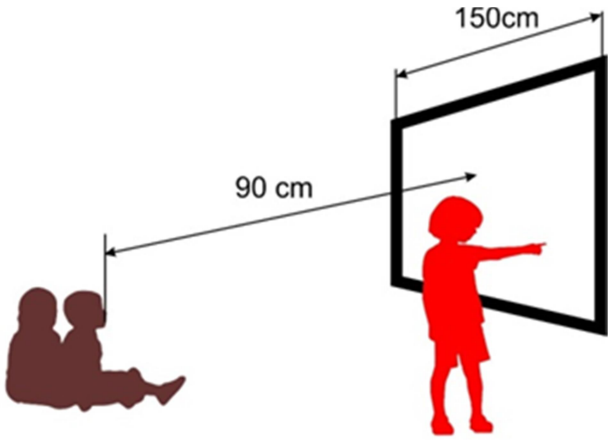
- When played individually, place the device upright, 20 to 30cm before the child. Classroom lighting should be dim.



- When played in pairs with a tablet or computer, place the device on a table at 50cm or less from each of the two children (if one of them has visual difficulties, he/she should be a little closer, similar to when playing individually).



- If the game is played in a group, we recommend using a digital whiteboard or projector, placed closest to the ground, so it enters the natural field of vision of the child. The maximum distance for a 150cm wide device should always be less than 90cm (considering the visual capabilities of students with ~10% of vision). You can also use a tablet but reducing the distance according to individual use. Classroom lighting should be dim.



WORKING METHODOLOGY: explain the child at first the dynamic of the game properly, and help him/her until they achieve enough autonomy. This is a game of visual speed and perception ability, and time of completion is important, so although the game does not have a time limit, we recommend you to promote some degree of speed to solve it, always with the abilities, needs, and visual conditions of the child in mind.

This game can also be combined with various group dynamics and work methodologies in the classroom, like playing with two or more groups that compete with eachother, with the members of each group playing collaboratively.

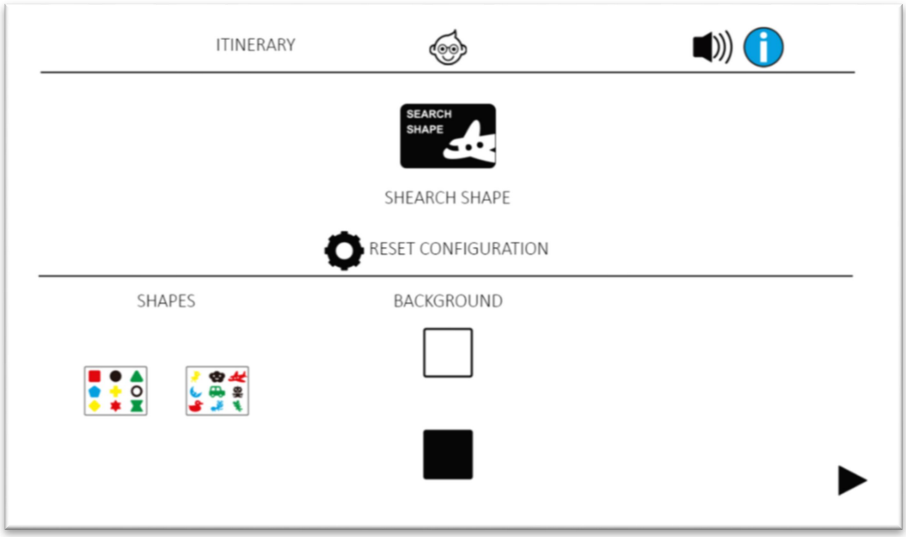
The teacher must ensuring compliance with the turns and empowering and helping the children to actively participate and promote their social and cooperative skills. If necessary, help them interact with the device.

The game should be played while seated, with the screen upright, in a table or a tilted lectern with if necessary. The activity -in its different configurations- should have a maximum length of 15 minutes.

CONFIGURATION FOR THE GAMES: configure the games regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development.

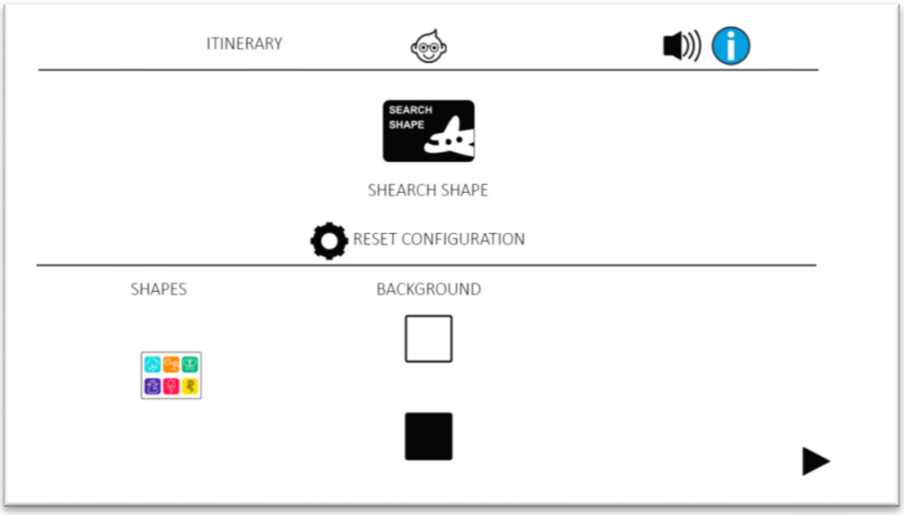
The configuration panel for **SHEARCH SHAPE** is divided in 2 aspects:

- **Shapes:** there are 2 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.



The configuration panel for **SHEARCH SHAPE+** is divided in 2 aspects:

- **New shapes**: there is now the option of choosing a new set of shapes. Its design has been established to start working on linear shapes; the same drawing may appear with a different colored background.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.



HOW DOES IT WORK: the games consist in looking for the same shapes with different colors (only the shape matters). At the bottom of the screen, a frameless shape will be the reference model. Touch the framed tiles that have the shape matching the model.

The game can be complemented with oral descriptions of the shapes by the student, and numerical exercises with the tiles.

CRITERIA TO EVALUATE: these are a games designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- Notice if the child is able to detect all colors and in which shapes.
- Does the child actively participate in the game and enjoy group games?
- Is the child able to follow rules and respect turn order?
- Does the child properly accept losing in a game?
- Do the children interact with their peers, both with and without disabilities?
- Do the children know how to use the e-board to access the games and activities?
- Notice if the child has hand-eye coordination and is able to touch and drag a shape on the screen.
- In individual use, strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security with the former.

CURRICULAR OBJECTIVES DEVELOPED: these games enable the development of the objectives set in the curricula of pre-primary schools in the partner countries:

1. The child actively participates in different kinds of games.
2. The child shows coordinated motor abilities.
3. The child analyzes perceptive characteristics of materials with his/her senses.
4. The child makes collections establishing similarity, difference, order, class, and quantity relationships.
5. The child classifies objects using perceptible criteria.
6. The child shows interest in learning new handling abilities.
7. The child shows coordinated motor abilities.
8. The child regulates his/her expression of feelings and emotions in the game through language.
9. The child follows the rules of the game.
10. The child knows the importance of the rules of the game.
11. The child enjoys group games.
12. The child compares different images.
13. The child uses the audiovisual and technological means of the school for their enjoyment, creation, and learning.
14. The child uses educational programs to apply their acquired knowledge.
15. The child uses precise and fine body movements.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

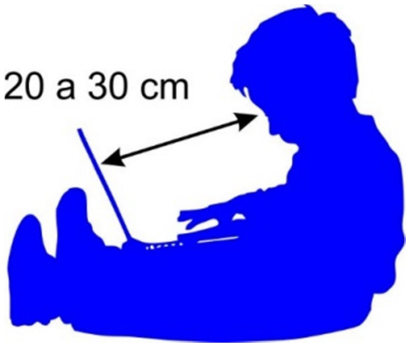
MEMORY and MEMORY+

LEVEL OF THE GAMES: Middle, intended for the second level of the second cycle of pre-primary education.

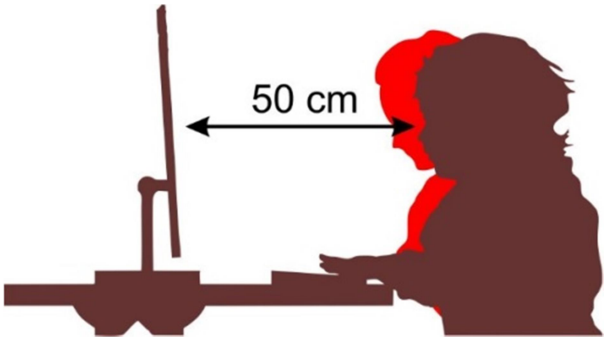
OBJECTIVE OF THE GAMES: Enhancing memory and focus capabilities.

SETTING FOR THE ACTIVITY: this game can be played individually, in pairs (sharing a tablet), or in a group (3-4 children max.), where children should take turns.

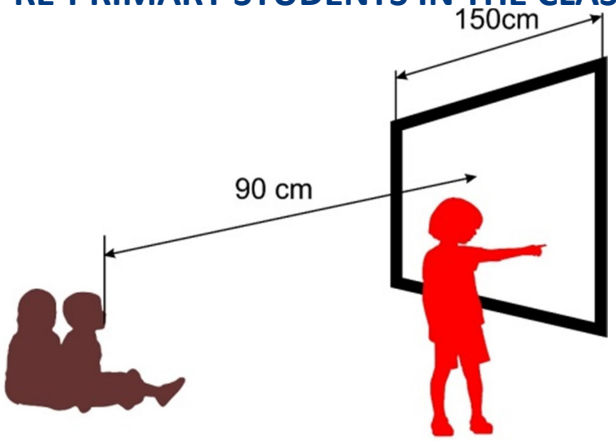
- When played individually, place the device upright, 20 to 30cm before the child. Classroom lighting should be dim.



- When played in pairs with a tablet or computer, place the device on a table at 50cm or less from each of the two children (if one of them has visual difficulties, he/she should be a little closer, similar to when playing individually).



- If the game is played in a group, we recommend using a digital whiteboard or projector, placed closest to the ground, so it enters the natural field of vision of the child. The maximum distance for a 150cm wide device should always be less than 90cm (considering the visual capabilities of students with ~10% of vision). You can also use a tablet but reducing the distance according to individual use. Classroom lighting should be dim.



WORKING METHODOLOGY: in this game, time of completion is important, so although the game does not have a time limit, we recommend you to promote some degree of speed to solve it, always with the abilities, needs, and visual conditions of the child in mind, as well as an important mechanism to enhance group game and the socialization of the students.

This game can also be combined with various group dynamics and work methodologies in the classroom, like playing with two or more groups that compete with eachother, with the members of each group playing collaboratively.

The game played individually or in pairs should be done so while seated, with the device on a table or tilted lectern if necessary. If it is played in pairs or groups with an e-board, the children should be seated at the distance defined before and stand up to interact following a turn order.

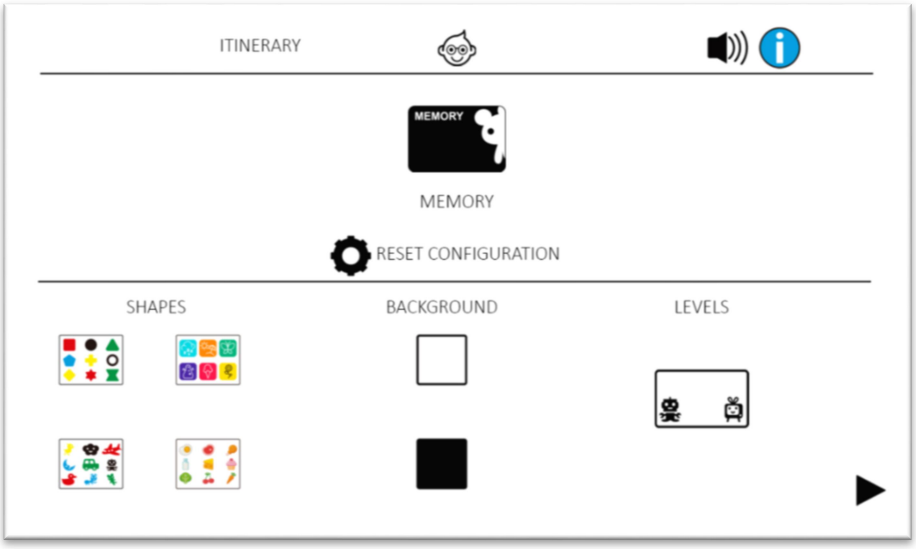
The teacher must ensure compliance with the turns and empowering and helping the children to actively participate and promote their social and cooperative skills. If necessary, help them interact with the device.

The game should be played while seated, with the screen upright, in a table or a tilted lectern with if necessary. The activity -in its different configurations- should have a maximum length of 15 minutes 2 or 3 times a day.

CONFIGURATION FOR THE GAMES: configure the games regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development.

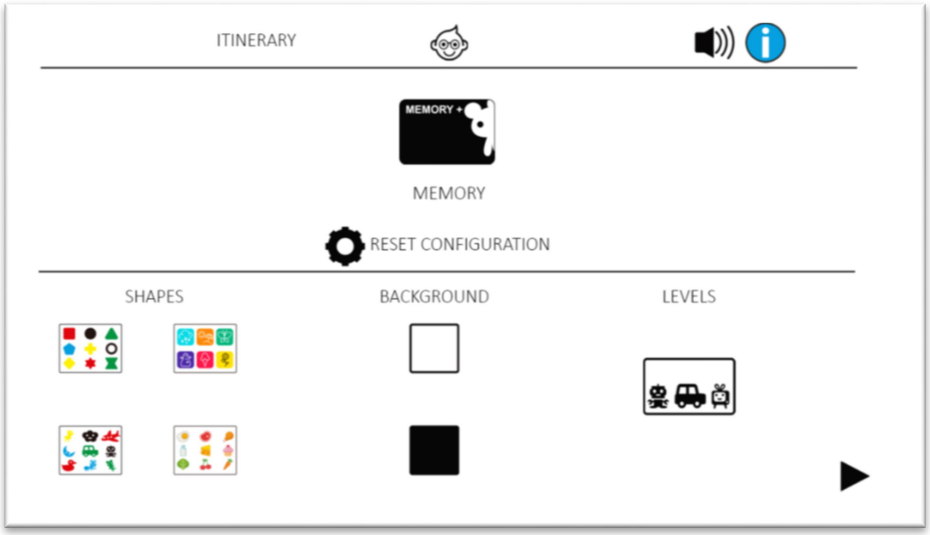
The configuration panel for **MEMORY** is divided into 3 aspects:

- **Shapes**: there are 4 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Level**: there 3 pairs of shapes in this level (a total of 6 tiles).



The configuration panel for **MEMORY+** is divided into 3 aspects:

- **Shapes**: there are 4 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Level**: there 5 pairs of shapes in this level (a total of 10 tiles).



HOW DOES IT WORK: the game consists in looking for pairs of shapes and remembering their location. For this, select two cards consecutively from the available (hidden) ones; if they have the same shape, they will both disappear, reducing the remaining ones. The game ends when all cards disappear.

When played in a group, we recommend that the child passes the turn for every 2 cards, independently of him/her guessing right or wrong, to reduce the competitiveness of the game.

CRITERIA TO EVALUATE: this is a game designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- Notice if the child is able to detect all colors and in which shapes.
- Notice if the child has visual memory.
- Does the child actively participate in the game and enjoy group games?
- Is the child able to follow rules and respect turn order?
- Does the child properly accept losing in a game?
- Do the children interact with their peers, both with and without disabilities?
- Do the children know how to use the e-board to access the games and activities?
- Notice if the child has hand-eye coordination and is able to touch and drag a shape on the screen.
- In individual use, strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security in the latter.

CURRICULAR OBJECTIVES DEVELOPED: this game enables the development of the objectives set in the curricula of pre-primary schools in the partner countries:

1. The child actively participates in different kinds of games.
2. The child shows coordinated motor abilities.
3. The child shows memory and logical thinking abilities.
4. The child shows interest in learning new handling abilities.
5. The child regulates his/her expression of feelings and emotions in the game through language.
6. The child follows the rules of the game.
7. The child knows the importance of the rules of the game.
8. The child enjoys group game.
9. The child compares different images.
10. The child uses the audiovisual and technological means of the school for their enjoyment, creation, and learning.
11. The child uses educational programs to apply their acquired knowledge.
12. The child uses precise and fine body movements.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

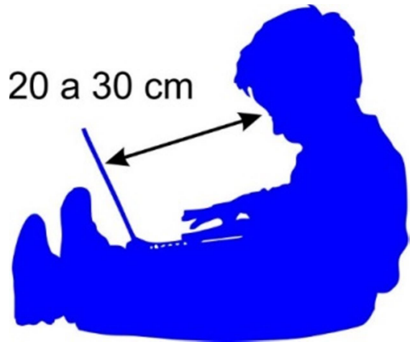
SEARCH SERIES and SEARCH SERIES+

LEVEL OF THE GAMES: Middle, intended for the second level of the second cycle of pre-primary education.

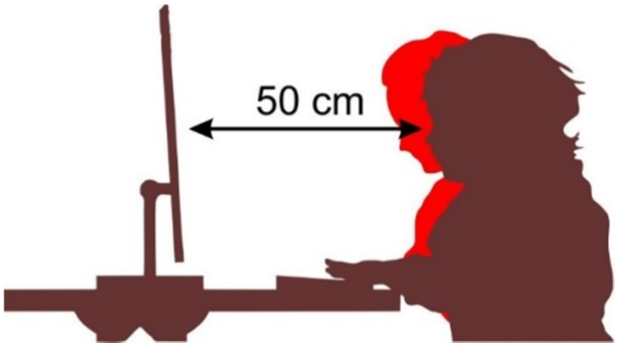
OBJECTIVE OF THE GAMES: Enhancing visual perception and boosting logical thinking.

SETTING FOR THE ACTIVITY: these games can be played individually, in pairs (sharing a tablet), or in a group (3-4 children max.), where children should take turns.

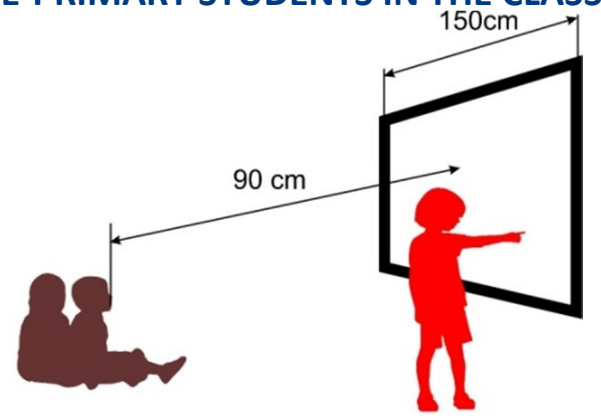
- When played individually, place the device upright, 20 to 30cm before the child. Classroom lighting should be dim.



- When played in pairs with a tablet or computer, place the device on a table at 50cm or less from each of the two children (if one of them has visual difficulties, he/she should be a little closer, similar to when playing individually).



- If the games are played in a group, we recommend using a digital whiteboard or projector, placed closest to the ground, so it enters the natural field of vision of the child. The maximum distance for a 150cm wide device should always be less than 90cm (considering the visual capabilities of students with ~10% of vision). You can also use a tablet but reducing the distance according to individual use. Classroom lighting should be dim.



WORKING METHODOLOGY: the child should play with your help or in a group at first, depending on their autonomy.

These games can also be combined with various group dynamics and work methodologies in the classroom, like playing with two or more groups that compete with eachother, with the members of each group playing collaboratively.

The games played individually or in pairs should be done so while seated, with the device on a table or tilted lectern if necessary. If it is played in pairs or groups with an e-board, the children should be seated at the distance defined before and stand up to interact following a turn order.

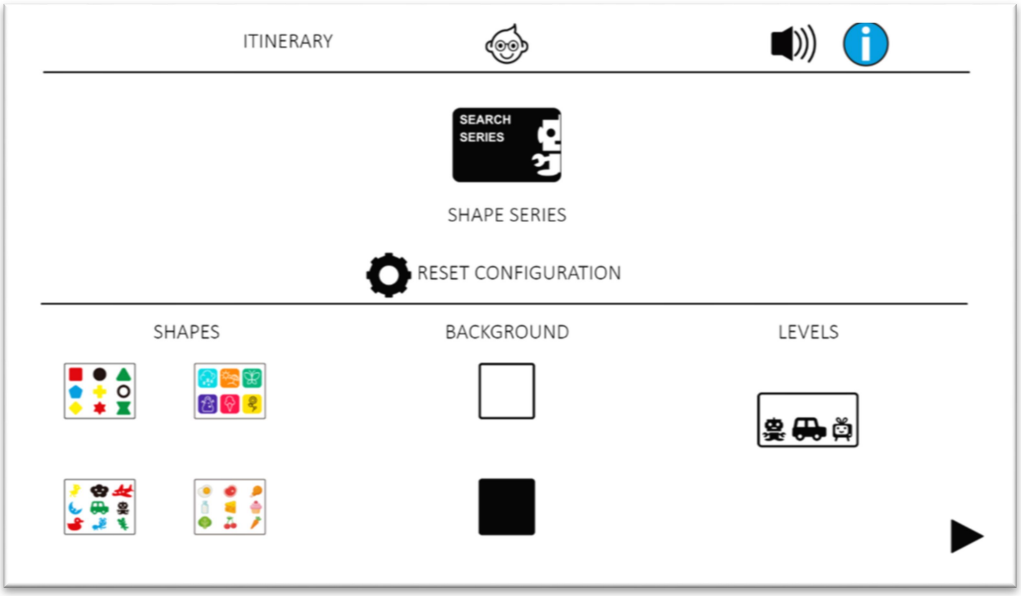
The teacher must ensure compliance with the turns and empowering and helping the children to actively participate and promote their social and cooperative skills. If necessary, help them interact with the device. Also, monitor the progression in the game, especially regarding time of completion, and advance the level when enough confidence and autonomy has been achieved by the child/ren.

The game should be played while seated, with the screen upright, in a table or a tilted lectern with if necessary. The activity -in its different configurations- should have a maximum length of 15 minutes.

CONFIGURATION FOR THE GAMES: configure the games regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development.

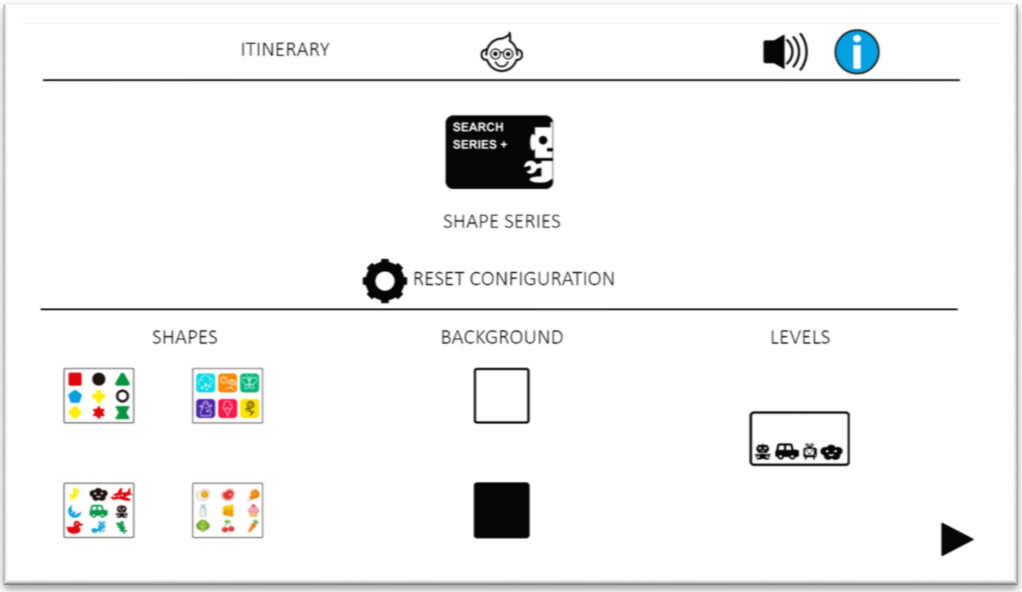
The configuration panel of **SEARCH SERIES** is divided into 3 aspects:

- **Shapes**: there are 4 different sets of shapes to choose from.
- **Background**: **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Level**: there is one series of 3 shapes.



The configuration panel of **SEARCH SERIES+** is divided into 3 aspects:

- **Shapes**: there are 4 different sets of shapes to choose from.
- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Level**: there is one series of 4 shapes.



HOW DOES IT WORK: the games consist of repeating the series in the established order. 3 or 4 different shapes in frames will appear at the top of the screen, determining the series to follow. In the middle of the screen there will be some black/white empty frames; and the shapes to be dragged to the black/white frames to match the model series will appear at the

bottom. The game can be complemented with oral descriptions by the student, and numerical exercises with the tiles.

CRITERIA TO EVALUATE: this is a game designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- Notice if the child is able to detect all colors and in which shapes.
- Notice the logical capabilities of the child.
- Does the child actively participate in the game and enjoy group games?
- Is the child able to follow rules and respect turn order?
- Does the child properly accept losing in a game?
- Do the children interact with their peers, both with and without disabilities?
- Do the children know how to use the e-board to access the games and activities?
- Notice if the child has hand-eye coordination and touches and drags shapes on the screen.
- In individual use, strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security with the former.

CURRICULAR OBJECTIVES DEVELOPED: this game enables the development of the objectives set in the curricula of pre-primary schools in the partner countries:

1. The child actively participates in different kinds of games.
2. The child shows coordinated motor abilities.
3. The child analyzes perceptive characteristics of materials with his/her senses.
4. The child classifies objects using perceptible criteria.
5. The child shows interest in learning new handling abilities.
6. The child shows coordinated motor abilities.
7. The child regulates his/her expression of feelings and emotions in the game through language.
8. The child follows the rules of the game.
9. The child knows the importance of the rules of the game.
10. The child enjoys group games.
11. The child compares different images.
12. The child uses the audiovisual and technological means of the school for their enjoyment, creation, and learning.
13. The child uses educational programs to apply their acquired knowledge.
14. The child uses precise and fine body movements.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

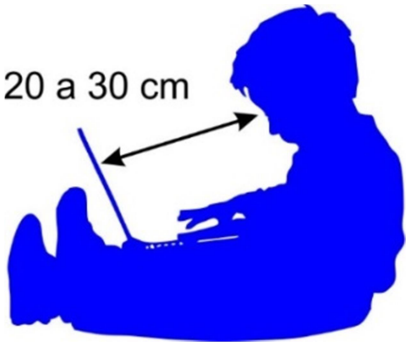
PUZZLE and PUZZLE+

LEVEL OF THE GAMES: Hard, intended for the end of the second level of the second cycle of pre-primary education.

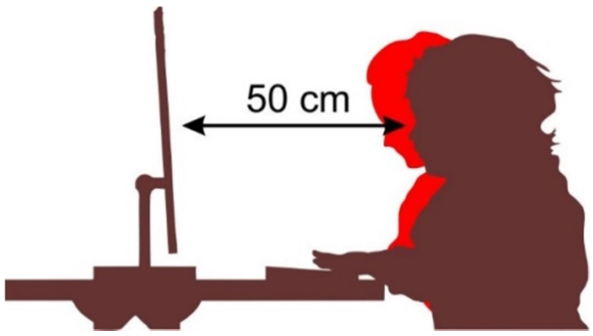
OBJECTIVE OF THE GAMES: enhancing problem resolution capabilities and visual perception.

SETTING FOR THE ACTIVITY: these games can be played individually or in pairs by sharing a tablet and/or taking turns.

- When played individually, place the device upright, 20 to 30cm before the child. Classroom lighting should be dim.



- When played in pairs with a tablet or computer, place the device on a table at 50cm or less from each of the two children (if one of them has visual difficulties, he/she should be a little closer, similar to when playing individually).



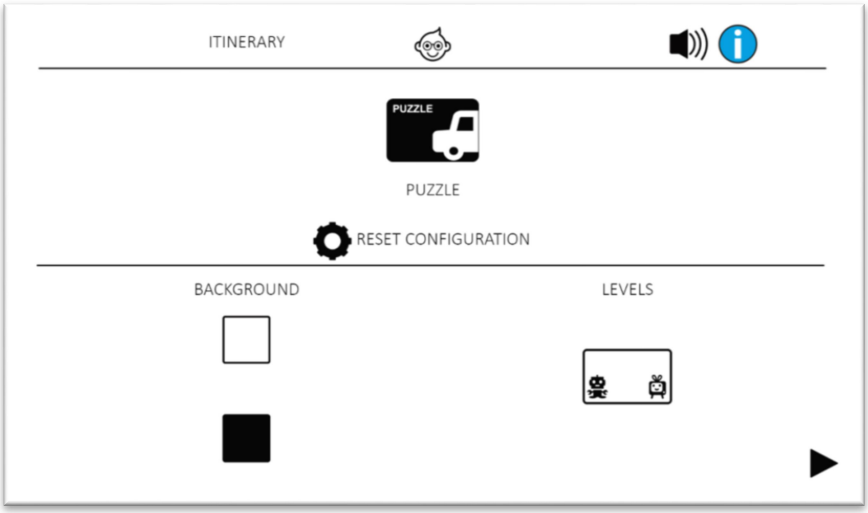
WORKING METHODOLOGY: explain the dynamics of the games properly and help the child at first, until he/she has enough autonomy. Also, Track the child's progression in the game, especially regarding time of completion.

The game should be played while seated, with the screen upright, in a table or a tilted lectern with if necessary. The activity -in its different configurations- should have a maximum length of 15 minutes.

CONFIGURATION FOR THE GAMES: configure the games regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development.

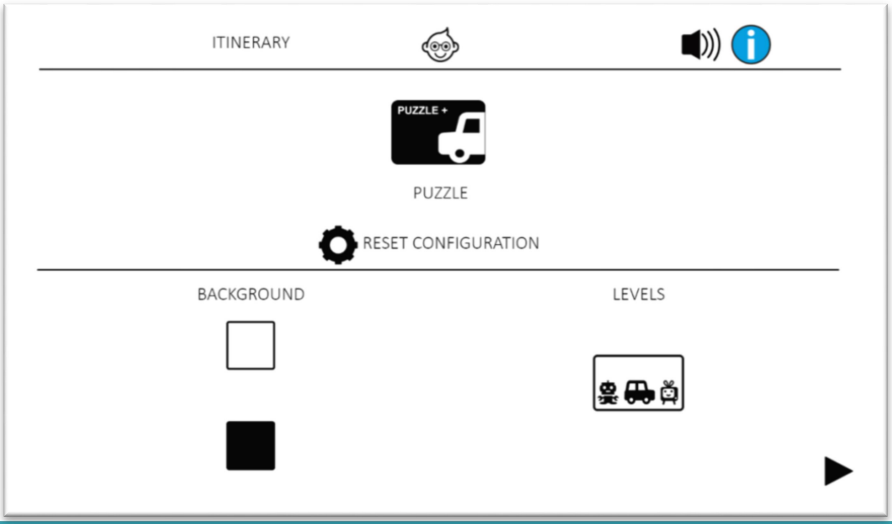
The configuration panel for **PUZZLE** is divided into 2 aspects:

- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Level**: this level has simple puzzle models of 3 shapes.



The configuration panel for **PUZZLE+** is divided into 2 aspects:

- **Background**: depending on the child's needs, choose between black or white background, each with a combination of colors.
- **Level**: this level has simple puzzle models of 6 shapes.



HOW DOES IT WORK: a model of 9 tiles with shapes will appear on the right side of the screen, and on the left side an empty 9-tile grid. At the bottom, different shapes will appear; drag them to their correct position in the empty grid, matching the model. New shapes will not appear until the previous one has been correctly placed.

CRITERIA TO EVALUATE: this is a game designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- Notice if the child is able to recognize series and repeat them.
- Does the child use an established color model?
- Does the child actively participate in the game and enjoy group games?
- Notice if the child is able to understand the problem and solve it.
- Does the child properly accept losing in a game?
- Do the children interact with their peers, both with and without disabilities?
- Do the children know how to use the e-board to access the games and activities?
- Notice if the child has hand-eye coordination and touches and drags shapes on the screen.
- In individual use, strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security in the latter.

CURRICULAR OBJECTIVES DEVELOPED: this game enables the development of the objectives set in the curricula of pre-primary schools in the partner countries:

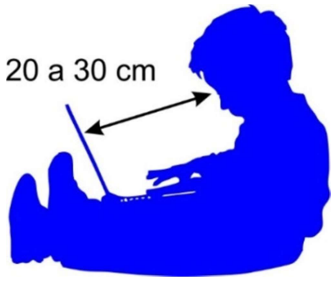
1. The child actively participates in different kinds of games.
2. The child shows coordinated motor abilities.
3. The child analyzes perceptive characteristics of materials with his/her senses.
4. The child classifies objects using perceptible criteria.
5. The child poses hypotheses anticipating possible results (what would happen if...?).
6. The child makes collections establishing similarity, difference, order, class, and quantity relationships.
7. The child shows interest in learning new handling abilities.
8. The child regulates his/her expression of feelings and emotions in the game through language.
9. The child follows the rules of the game.
10. The child compares different images.
11. The child enjoys group game.
12. The child compares different images.
13. The child uses the audiovisual and technological means of the school for their enjoyment, creation, and learning.
14. The child uses educational programs to apply their acquired knowledge.

SPACE MISSION

LEVEL OF THE GAME: Final test (bonus game), very hard; intended as a support for children with already developed capabilities.

OBJECTIVE OF THE GAME: reinforce the psychomotor abilities acquired in all the previous proposed activities and games.

SETTING FOR THE ACTIVITY: this game should be played individually, placing the device upright, 20 to 30cm before the child. Classroom lighting should be dim.

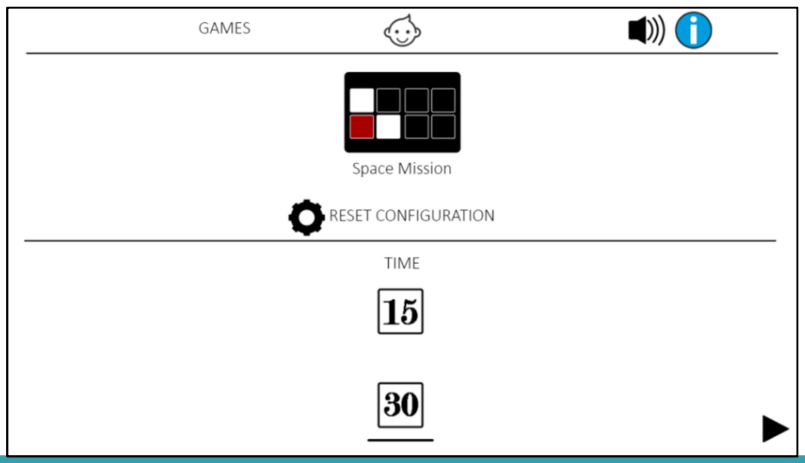


WORKING METHODOLOGY: explain the dynamics of the game correctly to the child, and help him/her first, until he/she has enough autonomy. As a teacher, sit next to the student while he/she plays the game on the device. Once the dynamics of the game have been fully understood, let him/her interact independently.

The game should be played while sitting down, with the screen on vertical position, resting on a table or lectern with a certain inclination if necessary.

CONFIGURATION FOR THE GAME: configure the game regarding the shapes shown, their colors, and the background, depending on the needs of the student and his/her stage of development. Once satisfactory results are obtained, you can try other configurations:

- **Time**: depending on the needs and the desired difficulty, select the length of the game between 15 and 30 seconds.



Co-funded by the Erasmus+ Programme of the European Union

HOW DOES IT WORK: the game consists in moving the spaceship (drawn in colors harder to perceive) to dodge the meteorites. The spaceship is moved with the finger, by touching or clicking on it and dragging it across the screen. You win if you dodge meteorites for the established time, either 15 or 30 seconds.

CRITERIA TO EVALUATE: this is a game designed to evaluate the ability to perceive shapes and colors by students with low vision as well as those without. Thus:

- See if the child can properly react to and avoid the meteorites.
- Does the child properly accept losing in a game?
- Does the child interact with their peers, both with and without disabilities?
- Does the child know how to use the e-board to access the games and activities?
- Notice if the child has hand-eye coordination and is able to touch and drag objects on the screen.
- Strengthen the bonds of affection between the child and the teacher, reinforcing their trust and security with the former.

CURRICULAR OBJECTIVES DEVELOPED: this game enables the development of the objectives established in the curricula of pre-primary schools in the partner countries:

1. The child actively participates in different kinds of games.
2. The child shows coordinated motor abilities.
3. The child enjoys his/her motor achievements.
4. The child shows fine handling skills.
5. The child shows interest in learning new handling abilities.
6. The child regulates his/her expression of feelings and emotions in the game through language.
7. The child knows the basic notions of orientation and movement coordination.
8. The child changes and adapts his/her posture to different games and situations.
9. The child follows the rules of the game.
10. The child knows the importance of the rules of the game.
11. The child enjoys group games.

CHECK YOUR RESULTS: if you have any doubt about the results obtained, you can contact the experts of the partnership of this project, who will help you identify and take appropriate action with students with low vision, especially if they show signs of Aniridia or Albinism.

COURSE FOR
PRE-PRIMARY SCHOOL
TEACHERS

DIDACTIC UNIT 6

ACTIONS OF PRE-PRIMARY TEACHERS FACING LOW VISION IN THE CLASSROOM

Looking out for a School for All

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Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission.
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Co-funded by the
Erasmus+ Programme
of the European Union

COURSE FOR PRE-PRIMARY SCHOOL TEACHERS

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"What the teacher is, is more important than what he/she teachers."

- Karl A. Menninger

OBJECTIVES OF THE DIDACTIC UNIT

By the end of this chapter, you will:

- Know the main teaching objectives of pre-primary education.
- Learn about the new approach to special educational needs (SEN) in students with visual impairment.
- Identify the most relevant differential behaviors in the learning of children with low vision, and apply the inherent guidelines.
- Classify the different modes of curricular to students of pre-primary education with visual impairment.
- Apply the basic guidelines for didactic intervention from an adaptation perspective to the visual characteristics of students.
- Know the differential elements that condition the necessary adaptation to the haptic or visual characteristics of the students.
- Know the main stages for carrying out the necessary curricular adaptations for students with visual impairment.
- Raise awareness on the treatment of diversity that should be in the education of children with low vision.

INTRODUCTION

In order to understand the SEN of visually impaired students and the general educational lines that characterize psycho-pedagogical intervention in this population; this chapter addresses this matter from a theoretical point of view that can be framed in a harmonious and multidisciplinary conception. This is due to the necessary different agents that a student with visual impairment requires in the educational

process (professionals from general and specialized education, support teams, family members, beneficiary entities, etc.) to meet their educational needs and offer them tailored responses to those needs. Secondly, a harmonic or eclectic approach is postulated, considering joining the different elements or doctrines that the new pedagogical model of SEN supports, integrating other conceptions like cognition and behavior in the development of types of intervention for different areas and strategies, among others.

The chapter introduces the main SEN of visually impaired students, once the objectives to be developed in the pre-primary education stage are defined, with the aim of establishing the conceptual bases on which learning is built. The different types of curricular adaptations inherent to visual impairment are included below, according to the continuum that supposes the great diversity of the students who also have other impairments. The curricular adaptations analyzed incorporate the technical and organizational elements or resources to access the curriculum and the individual curricular adaptations that the students need to compensate for their inequalities compared to normo-visual peers.

Lastly, the collaboration of the teacher with the families and the associations of beneficiaries in the educational process is analyzed, and some practical recommendations for work in and outside the classroom are offered.

6.1 OBJECTIVES TO REACH IN PRE-PRIMARY EDUCATION

The educational systems analyzed for each of the participating countries must guarantee all the students in their classrooms the opportunity to develop all their skills. Consequently, it is necessary that schools, teachers, families, teams, and institutions have the necessary resources to offer the best response to the needs of the students. In line with and preceded by the content of the previous Didactic Units, we believe necessary to address in this chapter the specific basic competences, in addition to those established in the school curriculum, that students with visual impairment must have acquired at certain critical ages in their schooling and development to be in conditions of equality.

Observation of reality has shown us that success in life and full personal development exceeds purely academic one. We frequently meet students who, despite having successfully completed their studies (including middle or university studies), face significant personal difficulties when entering the labor world and for the construction of their own life projects. In this sense, we believe that it is important to help these students from the start in their development as persons with visual impairment, so they acquire all the knowledge, attitudes, habits, and skills that allow them to face their future in the best possible way conditions. This is even more necessary if we consider the scenario we are facing in a world that is increasingly complex and changing, for which they must prepare to operate, with a solid and deep training being essential, both personal, and academic. To contribute to this, the participating entities of this project, with the help of publications and studies carried out by ONCE Department of Education, Employment, and Cultural Promotion, and their counterparts in the rest of European countries, raise the need to unite objectives and information and establish common criteria to define which are the Specific Basic Competences – the capabilities that determine the correct and complete integral development of the students with visual impairment must have acquired at the end of the early

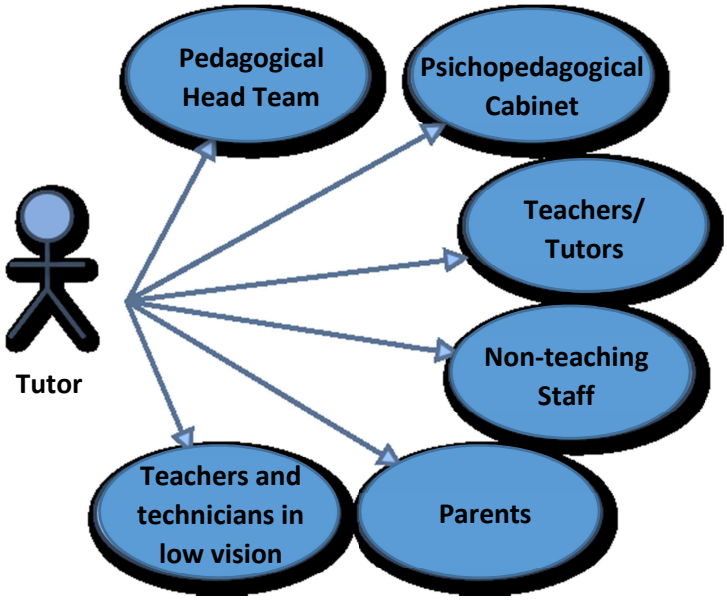
education stage (6 years old). These are included in the following annex: Specific Basic Competences for low vision in pre-primary education, 160 items.

To summarize, during the early education stage, we will contribute to develop in children the capabilities that allow them to achieve the following objectives:

- Know their own body and of others, its possibilities of action and learn to respect differences.
- Observe and explore their family, natural, and social environment.
- Acquire progressive autonomy in their usual activities.
- Develop their affective capabilities.
- Interact with others and progressively acquire basic guidelines for coexistence and social relationships, and train in peaceful conflict resolution.
- Develop communication skills in different languages and forms of expression.
- Begin with logical-mathematical skills, reading, writing, and movement, gestures, and rhythm.

6.2 RECOMMENDATIONS

Students with Albinism and Aniridia are included in ordinary education, with specific educational support needs (SESN), which we will talk about in the next section. Children with visual impairment, for the most part, have been diagnosed before reaching school; but if this is not the case teachers become who detect signs that point to possible visual problems (although the ultimate diagnosis comes from the ophthalmologist), so early detection is very important for a quick intervention. Since the incorporation of these students to the school, pre-primary education teachers are responsible for their progress with the necessary help, and it is their responsibility to act quickly and efficiently so students with low vision feel identified and understood in the difficulties they face every day.Teachers will be coordinated by the classroom teacher and will involve those who intervene in the classroom and the staff assigned to the duties of educational guidance; they will also coordinate the contributions made by parents and low vision technicians, and will be responsible for notifying the non-teaching staff of the center of the difficulties of this type of student and the measures they must take if they are users of certain services: dining room, school yard, secretary… Before making any decisions and applying any support and reinforcement measures, an initial or previous evaluation will be carried out to detect any needs. This information will allow to organize the type of educational response appropriate to their specific needs, a response that allows them to achieve the objectives established in the curriculum. However, in no case will the evaluation be discriminatory in nature nor will it delve into their limitations or classify in any way, but rather determine the help they require so that they can progress in a least restrictive possible school context



It is very important to start from the educational inclusion in coherence with the current educational proposal of attention to diversity, to:

- Guarantee the development of these students.
- Promote equity.
- Promote social cohesion.
- Give an educational response to students who need it.

The type of measures to be taken will be those that will give adequate and specific responses to the needs derived from the low vision that children with Albinism and Aniridia have, and the difficulty of access to information through sight. These may consist of curricular and/or organizational changes, which we will also cover in more detail throughout this Didactic Unit.

Not all children with Albinism and Aniridia have the same field and visual acuity and, although they surely have common measures among those selected for this sensory impairment, there will also be other more specific measures that are individually adjusted to their residual vision. In addition to the ordinary curriculum, there is a whole series of specific contents for visual impairment that must be addressed for the development and evolution of these students to be successful. The objective is to adapt the teaching to the characteristics and needs of each student so that they can access the ordinary curriculum with the minimum possible modifications. To do this, in the following table we collect the functions that the educational community must take in the care for students with SESN:

- **Classroom teachers:**
  - Group flexibility according to activities.
  - Teamwork with specialized and support teachers, specialized professionals, non-teaching staff…
  - Communication with parents.
  - Gathering the necessary information.
  -

- **Team of technicians for pedagogical coordination:**
  - Ensuring and enabling schedule flexibility and the use of existing human resources in the school for attention to diversity.
- **School orientation team (psycho-pedagogical cabinet):**
  - Organization and distribution of functions based on the curricular adaptation carried out.
- **Other professionals:**
  - Coordination with the teacher-classroom teacher.
  - Assumption of its powers and responsibilities in the care of SESN.

Lastly, we cannot forget that **parents are an essential source of information** that teachers should not discard, since they know first-hand the genetic condition of their children and can provide many relevant data regarding pedagogical decisions. Their support also essential so some of the adaptations can be carried out in a coordinated way. It is also necessary to speak with low vision professionals (their contact is in the bibliography, with links of the European institutions or organizations), since they will provide their experience in this field and recommendations to make the necessary adaptations to students with Albinism and Aniridia.

To summarize, it is the teaching team, specifically classroom teachers, who is responsible for collecting the information from all persons involved and make decisions with the advice received. It is important that there is good coordination between classrooms and that it is fluid and bidirectional, so the visually impaired students feel that effort and adaptation measures are not only plausible in their classroom but also outside, in the schoolyard, the dining room, outside, and at home.

6.3 THE INCLUSIVE CLASSROOM

In order to build a new culture for people with SESN, the inclusive classroom and school are a response that not only recognizes but also values the heterogeneity of students, by focusing on development of the potential of each of them, not on their difficulties. This process of integration of persons with difficulties implies the need to rethink and restructure the duty and attitude of the teacher, family, and community towards the child with SESN; it must not only allow the development of their skills and potential so they can build knowledge, respecting their individual learning rhythm, but also allowing them to be active subjects of a non-exclusive education that offers equal conditions and opportunities. In this way, a quality education can be provided for all persons in a situation of disadvantage or vulnerability, which in most cases are more than SEN students.

6.3.1 INCLUSIVE EDUCATIONAL ENVIRONMENTS

Educational inclusion implies building or rebuilding the culture and educational identity of schools, their vision, and their mission. It also involves redefining the educational and social policies, action strategies, and a change in existing educational practices. To not repeat what was already described in Didactic Unit 4 regarding inclusive education, we add that referring to it involves a different way of approaching attention to diversity, and involves designing and implementing procedures to identify, locate, and

demolish obstacles in schools. It is more than just a reform to materialize resources that can be accessed by students with SESN, although it is a necessary condition.

In the words of Koichiro Matsuura, Director General of UNESCO (2008), "inclusive education can involve a wide variety of policies and approaches in different regions, although in most contexts the term is commonly used to refer to the strategies that seek to integrate students with special needs into general education schools. This vision of the problem is, however, too narrow".

When speaking of inclusive classrooms, we refer to the set of an educational system that guarantees basic education to the entire population of its environment, regardless of whether they show SEN or are at risk of social exclusion; a school that develops the curricular universal learning design (ULD) in its management of teaching-learning processes.

UNIVERSAL LEARNING DESIGN (ULD)

- A support system that favors the elimination of physical, sensory, affective, and cognitive access barriers for the learning and participation of the students.
- It considers that there are "disabling environments" not disabled persons.

Principles on which the ULD is based:

1. Representation
   It provides multiple means of representation regarding *what* to learn. It refers to the subject of the applications of the Multiple Intelligence Theory in the classroom.
2. Action and Expression
   It provides multiple means regarding *how* to learn. It offers various materials with which all students can interact, it facilitates different expressive options, and it stimulates towards effort, motivates towards a goal.
3. Commitment
   It offers many options that reflect the interests of the students, strategies to face new tasks, self-assessment options, reflections on their expectations, etc.

An inclusive educational environment includes a flexible curriculum with which all students learn together, allowing the learning and participation of all of them, structured as a learning community and immersed in the process of continuous improvement, because it considers evaluation as a key part of the educational process, consequently acting as a "learning organization".

Giné[1] and Font (2007)[2] propose this design since it favors the elimination of physical, sensory, cognitive, and affective access barriers to learning and participation for all students, regardless of their specific needs. Changes the paradigms in education by moving away from the model focused on student

[1] Climent, Giné Giné. Doctor of Psychology. Associate Professor. Dean, of Facultat de Psicologia, Ciències de l'Educació i de l'Esport Blanquerna de la Universitat Ramon Llull. Main researcher of the Disability and Quality of Life Research Group. Educational Apects; Spain.
[2] Giné, C. and Font, J. (2007) Students with intellectual and developmental disabilities. In Joan Bonals and Manuel Sánchez-Cano (coord.) Manual of Pedagogical Advice; Barcelona, Editorial Grao.

difficulties and looking at what it considers "disabling environments". This model assumes that the problems generated by the lack of accessibility are directly related to the exercise of rights and the fulfillment of duties, so these problems cannot be tackled with just the removal of physical barriers.

They point out that it is necessary to identify why these barriers occur, what can be done to prevent them from originating again, and how to develop the measures, programs, and policies necessary to advance towards equality of opportunities and the fulfillment of duties. These barriers are the set of elements of diverse nature (formal, material, organizational, functional, attitudinal, etc.) that hinder the development of educational inclusion and can be from a specific way of teaching, to the norms that rule the academic organization, how the support of the school is organized, or exclusive attitudes.

Education is a basic right, being a responsibility of the public powers (the pertinent educational administration: central, regional, or local), of the educational centers as an organization (teaching and non-teaching professionals), and of the families (individually and through associations) to ensure compliance in an inclusive manner. Therefore, all this socio-educational speech recognized in the law must be coupled in the educational practice by a change in methods, organization, and educational response, that leads to a change in attitudes and beliefs towards disabilities, and more specifically -in our case- to the visual impairment associated with Albinism and Aniridia.

6.3.1.1 EDUCATIONAL NEEDS DERIVED FROM LOW VISION

The current trend in the EU is to develop policies aimed at integrating students with SEN within ordinary school, providing teachers with various types of support, like supplementary staff, materials, training courses, and equipment. As we know from Eurydice[3] reports, the definitions and categories of SEN vary from country to country, but in the case of the three project partner countries (Norway, Italy and Spain), they are defined by the same characteristics and definitions. This is why we believe it is necessary to clarify one definition of SEN, to better understand the concept and know what we are referring to when talking about students who have them. For this, we will refer to two definitions that can help us clarify this concept:

The first is the one in the current Spanish Education Law, and that is similar to the other partner countries, since it is the definition that all educational centers should be aware of. This law states that students with SEN are "*those who require, for a period of their schooling or throughout all of it, certain specific educational supports and care derived from disabilities or serious conduct disorders*".

The second definition is given by Jiménez (2001)[4], which in our opinion is broader and more complete, since it does not only include children with disabilities, but also those who need special attention due to their environment or imbalances in their learning. It also points out curricular adaptations, like how students who need SEN can access the curriculum just like the others. Children with SEN are established as: "those who have difficulties greater than the rest of the students to access the learning determined in the curriculum for their age (either due to internal causes, due to difficulties or deficiencies in the

[3] The Eurydice Spain-REDIE web portal disseminates the work of the Spanish and European information networks on Education: Eurydice, from the European Commission, and REDIE, from the Spanish educational administrations.
[4] Jiménez, I. (2010). The vision of the inclusive school in society. Jaén: Íttakus.

socio-family environment, or due to a poor learning history), and they need adaptations and/or significant curricular adaptations in various areas of said curriculum to compensate for those difficulties". Therefore, we believe that the latter definition is better suited to our focus on the inclusion in classrooms and educational centers we define throughout the guide, since it assumes that the students' difficulties are not only within them, but also depend on contextual variables. It is important not to focus on the degree of disability of the student, but on the degree of training that will be achieved if we cover these SEN.

As we have already pointed out in previous sections, among students with SEN are included those with visual impairment, so in this guide we are going to refer specifically to children with low vision produced by Albinism and Aniridia. Although the field of research is limited, the characteristics of visual impairment for this population are heterogeneous, and so will be the educational needs that arise from them. Variables such as the severity of the visual impairment, the degree of functionality of the residual vision, the existence of deficiencies concurrent with the low vision, the etiology of the visual disorder and its prognosis, etc. will determine the educational intervention. Thus, the educational support of a child with Albinism or Aniridia must start from the knowledge of the characteristics determined by their visual pathology, to adapt their environment and put into practice a series of strategies appropriate to the intervention, so their visual functioning is adequate.

For this, we need a previous assessment to know the child's starting situation, consulting their ophthalmological report, medical history, educational history, and psycho-pedagogical evaluation. The type of visual impairment of the child is what will determine the specific educational needs they require. SEN always refer to the personal, pedagogical, curricular, or material supports or aids that students with severe visual problems need to access the purposes of education. Given the interactive nature of the educational processes and the different characteristics of each school context and each student, the educational needs have a high degree of relativity and therefore constant reviews of the measures adopted must be carried out.

We will next present some needs shown by students with severe visual impairment, that allow us to get closer to the type of support they require, but considering that needs are always unique, inherent to the situation of a specific student and their context, which must be determined after a process of psycho-pedagogical evaluation.

SEN resulting from low vision:

- The need to integrate information from different sensory access routes.
- The need for an education and stimulation of the residual vision that maximizes its functionality.
- The need to internalize strategies and actions that ensure personal autonomy.
- The need to use technical support to access printed materials.
- The need to use material and supports that facilitate the participation and use of activities in the classroom.
- The need for acceptance, identity, and a positive self-esteem.
- The need to develop social skills and promote their social integration.
- The need to integrate and participate actively in the classroom and in the school.

6.3.1.2 THE REALITY OF THE STUDENT WITH LOW VISION IN THE CLASSROOM

Authors Ochaíta and Espinosa (1995)[5] state that the cognitive development of children with visual impairment in the school stage does not have serious problems (Cromer, 1973; Higgins, 1973). They are based on various works carried out on the integration of children with visual impairment (Gottesman, 1973, 1975; Ochaíta, Rosa, Huertas, Fernández, Asensio, Pozo and Martínez (1988); Fernández Dols, Fernández Lagunilla, Huertas, Maciá, Mateos, Montero, Ochaíta, Rivière, Rosa and Simón, 1991) that show that these children have few problems to integrate from a school point of view: they follow normal schooling and do not show social integration problems within a usual classroom. However, they warn of problems related to knowledge of space, orientation, and mobility; the difficulty in accessing written information is also stated, defining the educational needs of children with visual impairment to just two: (1) mobility and spatial knowledge, and (2) literacy.

Aerie; Castaño and Pérez (s.f.) establish, in the same way as in the previous section, the need for a previous assessment to know the child's starting situation, with an ophthalmological report, medical history, educational history, and psycho-pedagogical evaluation. Consequently, it is the type of visual impairment of the child what will mark the specific educational needs they require.

Andrade (2011)[6] recognizes that the educational needs of these children are broader than those addressed by Ochaíta and Espinosa (1995), and establishes general action strategies when facing the reality of students with visual impairment in classrooms. These strategies include:

- Acknowledging them as a person, for which it is necessary to establish a personal bond with the child, allow them autonomy, not denying their limitations… In short, acting naturally and returning to the student the image of a valuable person, above their deficiency.
- Finding out how you can get the most out of your child by obtaining information from the world in which they live and with which they must interact. This requires multi-sensory stimulation, working with real-life objects and situations, verbalizing all situations and anticipating events to avoid surprises, giving additional information, and controlling classroom noise.
- Keeping in mind that haptic perception is analytical, so the child needs more time to mentally compose globality. Once they have touched the object some times and in an organized way, they are able to better perceive real objects, static figures… It is necessary to work exploration with several objects at the same time, to work on differentiation, classification, etc. If the residual vision of the child does not allow working with materials printed in black letters, the use of the Braille code should be encouraged. In order for the child to imitate any motor gesture, they must be allowed to touch the model and/or perform the gesture on the child's body.
- Paying attention to the child's language, since it provides information on their thought structure and its contents. To do this, the child's personal experiences must be enhanced and the language and the search for a relationship between concepts must be based on them.

[5] Ochaita, E., y Espinosa, M. A. (2011). Development and education of blind and partially sighted children: Priority areas of intervention.
[6] Andrade, P. M. (2011). Students with visual disabilities. Needs and educational response.

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- Knowing their visual situation and its implications in terms of education and function, facilitating the use of necessary optical and non-optical aids and using a clear material that meets their needs.
- Appreciating the difficulty of the child regarding space and the position of objects. It is necessary to keep a fixed order and warn of any obstacle. If it is necessary to guide the child, get in front of them and try to ensure a good distribution of the structure of the environment to provide them with the greatest possible autonomy.

The author deduces that children with visual impairment in early education show a slower time both in gathering information and in carrying out tasks, so three aspects are collected to cover the needs derived from this: (1) respect the child's pace, giving them the time they need; (2) provide them with very clear work organization strategies; (3) encourage them to plan their own work, making a habit of this planning.

All these needs must be assessed from the curricular project to the classroom programming, where a curricular adaptation must be included for students integrated in the group. We will delve on these adaptations and types of intervention in the following sections.

6.3.2 INCLUSIVE EDUCATIONAL COMMUNITY

The current educational model of attention to SEN prevailing in Europe aims to provide an individualized response to them, as in the case that concerns us with students with Albinism or Aniridia, so they can access the curriculum just as those without these conditions. The corresponding educational administrations in each country are responsible for ensuring the necessary resources (both personal, material, and organizational) so the students who require a different attention can develop their abilities to the full extent possible in their school; it aims to achieve inclusion based on the integration, in this case, of students with Albinism or Aniridia.

In the past, the education of people with visual impairment was taught in specific centers dependent on organizations specialized in blindness and low vision, but now and due to the principle of standardization of services, attempts are made to include them in the ordinary system at each educational level, to the possible extent. The transformation of specific schools and high-schools into resource centers is a very common trend in Europe. Most countries report that they are planning to develop, are developing, or have already developed a network of resource centers in their countries. These are given different names and are also assigned different functions; some countries call them knowledge centers, others call them resource or expert centers. In general, these are responsible for the following tasks:

- Providing training and courses for teachers and other professionals.
- Development and dissemination of materials and methods.
- Support for ordinary centers and parents.
- Help for individual students (part-time).
- Guidance to enter the labor market.

Of course, this transformation has had and still has enormous consequences for special needs education. For this, the educational administration guarantees that students with SEN receive the necessary educational attention that allows them to develop their skills and personal relationships to the fullest, always in compliance with the principle of integration and the principle of individualization of teaching. To guarantee the compliance with both principles, it is necessary to provide schools with students with visual impairment with specific and necessary materials to adapt their study place and access to the curriculum. The adaptation of the study place and the access to the curriculum to students with low vision requires an interdisciplinary and coordinated work in which their family should be included as an essential element.

Lastly, it is worth mentioning that for the education of visually impaired children to be real and inclusive, it must be considered as a primary objective by the whole educational community: the team of education professionals, the family, and all competent public administrations. Within the team of education professionals, reference is made to:

- The Faculty, which marks the criteria and procedures to carry out the adaptations and curricular diversifications appropriate for the best attention to the students.
- The Pedagogical Cordination Commission, which must structure the educational project of the center with its Curricular Projects to acquire a high degree of coherence between the two and with the educational practices.
- The Teaching Team must be committed to guaranteeing the best possible principles of normalization and integration in the school.
- The classroom teacher, whose function is to put into practice the general approaches within their possibilities, and detect difficulties so they can be helped in their task by the rest of the team or department and by other teachers of the center.
- The support teacher, whose main mission is to support the classroom teacher in their attention to students with SEN and to the coordination bodies of the school. Their main functions in Pre-primary Education are:

    1. A systematic observation in the natural environment of the behavior of visually impaired children.
    2. A joint development of individualized curricular adaptations.
    3. Provide orientation regarding the methodological and organizational adaptations of the classroom and the adequate didactic materials and personal resources.
    4. Developing specific materials for the teaching and learning process.
    5. Establishing a relationship with the pedagogical services of the center or sector.
    6. Evaluating and promoting of students, including deciding on whether to withdraw or modify specific services.

6.3.2.1 GUIDELINES FOR THE TEACHER WHO RECEIVES STUDENTS WITH VISUAL IMPAIRMENT FOR THE FIRST TIME

Classroom teachers play an important role regarding the work to be done with the students with SEN who join ordinary schools: they are responsible for all students, but they also have didactic needs before the peculiar situation that involves the attention to a student with visual impairment in the classroom, so they have the aid of a specialist or support teacher in ordinary schools. Classroom teachers hope to receive advice that translates into an increase in their competence in caring for visually impaired students within the dynamics of the group. In this sense, they demand formative attention from the support teacher, to be able to answer to these demands and favor decision-making and autonomous initiatives, and fully exercise their role as teachers also for students with visual impairment.

We will talk about the role and functions of support teachers in the next section. For now, we will show what tasks the educational professionals referred to in this section should carry out in the classroom. These generally are:

- Favoring the incorporation of visually impaired students in the center. This consists of ensuring that their incorporation is as standardized as possible; the individual intervention plan (which we will talk about in detail later) should include a reception plan that begins before the incorporation of the student with visual impairment to the school -so they know its general structure and the main walks they will have to do-, culminating during the first days of school, getting to know their peers. A great tool for social integration in the classroom and to enrich coexistence can be to include the development of activities in the classroom in the reception plan, to understand the similarities and differences between people with visual impairment and those without.
- Facilitating visually impaired students the access to the curriculum: ensuring at all times that the information with which they and the teacher work in the classroom is accessible for the students at all times.
- The spatial organization of in the classroom, the location of students with visual impairment, the use of optical, non-optical and technological aids, etc. are all aspects that must always be taken into account in the classroom.
- Support books including the curricular objectives of the course must be available to these students at the beginning of the course, in a format fully accessible to them. The most accessible currently -as stated in DU4- are those in PDF (Portable Document Format), so the chosen books should be handed in this way if possible.
- Enriching the curriculum with objectives and contents related to visual impairment: objectives related to the development of orientation and mobility (a needed competence when visual impairment is severe) and the development of social competences in all cases.

Another objective to include is introducing new technologies in the classroom, for example typing and computer science contents.

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Lastly, we also wanted to point out some of the guidelines to be taken into account regarding attitude in the classroom, stated by the academic group Hercules of University of A Coruña[7]:

- Overcoming adult fear before the ignorance regarding visual impairment.
- Discussing any doubt or question on the subject with the support teacher.
- Using all the words that refer to visual impairment normally and without fear (eye, take a look, see, watch, etc.).
- Identifying ourselves before the child with visual impairment, since they may not recognize us, or give them the option to ask.
- When addressing the child with visual impairment, say their name so they are sure that we are talking to them and not to another child.
- Noticing them of the end of a conversation so they do not keep talking after.
- Continuing to use any gestures or expressions that we normally use, but trying to couple them with words so that they are not excluded.
- Not getting carried away by the dynamics of the subject, it is the adult person who sets the guidelines to follow.
- Giving them clear rules of reference, not just saying "the item is there" (pointing to the location itself).
- Giving them fixed reference points to allow them to locate their seat.
- Keeping materials or objects in the classroom in the same places and notify them of any changes.
- Providing ample spaces for you to explore.
- Encouraging and bringing them objects closer to explore them.
- Keeping their hands busy to avoid possible peculiar habits of self-esteem or isolation.
- Evaluate their work fairly, not abusing the "very well" if it is not deserved.
- Organizing collective games when we see that the child withdraws due to fear, relationship problems, or any other cause.
- Promoting the stimulation of the remaining senses with games and in the classroom (through dances, songs…).

6.3.2.2 COMPLEMENTARY AGENTS (SPECIFIC SUPPORT TEAMS)

The educational inclusion of students with visual impairment depends on the joint and coordinated action of certain services and agents external to the school institution: they are the specific support teams. The main objective of their intervention is to achieve the effective integration, inclusion, and normalization of students in all areas of their life. One of the key processes to be developed is the technical support and specialized advice to all agents in the educational community, to achieve maximum effectiveness in their impact on the educational environment. This team is not alone in their

[7] Publicación "El deficiente visual en la educación infantil". El Grupo Académico Hércules está formado: Abalde, E.; Arias Rodríguez, Mª. A; García-Fuentes, C. D.; Iglesias Cortizas, Mª.J.; Mendiri, P.; Muñoz Cantero, J.M.; Pérez González, Mª.L.

task to the students, but is responsible for the specific areas that need intervention due to visual impairment. Students are regarded globally, and teamwork is essential.

Keeping the educational community (family, centers, other teams, etc.) informed is on the one hand helping to understand the needs and capabilities of people with disabilities, and on the other improving the predisposition and attitudes of all of them. The agreements with the different public administrations serve to advance the culture of educational inclusion, starting from the reality of each community; it is not just an exchange of resources; legislation, awareness, and willingness to collaborate are reflected in these agreements.

The intervention in the school environment consists of advising the educational center, the classroom teacher and the rest of the educational community, providing enough information to facilitate the adequate evolution of the students, responding to the needs and type of intervention to be carried out, advising on methodological and didactic resources, areas of intervention, adaptation of didactic resources, etc. In Spain, the current model for the educational inclusion of blind and partially sighted students has its most characteristic and significant basic element in the Specific Support Team of ONCE (the Spanish organization for blind persons), complementing the work carried out by the Educational Counseling Teams (this team has a similar counterpart in Italy and Norway, the collaborating countries in this project).

These teams are comprised of different professionals directly related to the educational inclusion process of visually impaired students: psychologists, social workers, comprehensive rehabilitation technicians, tiflotechnical instructors, and support teachers. Among the actions of school inclusion support teachers, the following should be highlighted:

- Providing advice to the school and the rest of the educational community:
  - Working in coordination with guidance departments of schools to carry out evaluations and decide on the type of care and areas of intervention.
  - Providing enough information to facilitate the reception process and school development of students, needs, and types of intervention.
  - Raising awareness among the educational community.
  - Promoting the relationship and coordination between the school and the team, to favor the appropriate educational response to the needs of the students.
  - Promoting the relationship between school and family, to favor the normalization and adjustment of the educational response to needs.
  - Establishing common intervention criteria and exchanging information with the professionals that impact the students.
  - Collaborating with the Educational Guidance Teams and other specific teams (early care, hearing impairment, motor disabilities, generalized development disorders, etc.) through multidisciplinary assessment in the evaluation of students who require a higher degree of specialization, providing specific aspects (functional vision, personal autonomy, and access to information), collaborating on the aspects that require adaptations, indicating the qualitative influence of visual impairment and what needs are specified.

- Coordinating the actions to be carried out through the agreement monitoring committees.
- Collaborating with other institutions and teams (hospitals, Social Services) in detection campaigns for babies and children with visual impairment.

- Providing advice to the classroom teacher:
  - Reporting on the multidisciplinary assessment carried out and the need to work in specific areas of intervention.
  - Providing advice on methodological and didactic resources.
  - Supporting the classroom teacher and the school's support teacher.
  - Informing about the type of care to be provided: the Individual Care Plan with areas to intervene on, professionals, and frequency.
  - Adapt the necessary teaching resources and train the classroom and the school's support teacher on the development and use of these adaptations.
  - Work together with the classroom teacher on the Classroom teacher Action Plan, to enhance the adaptation of the school and social environment to the needs of the student.

- Intervention in the family environment:

  When visual loss occurs, the path to accepting the visual impairment begins, going through different stages and emotional states. There are critical situations that can alter the family balance and stability achieved, as we already discussed in DU2. The ultimate purpose of the intervention is, on the one hand, to provide parents with a space to express their crisis, and on the other to give the family -as ultimate responsible for the education of their child- information regarding the deficiency, and help enhance the personal and family resources necessary to raise their child, since their good development and inclusion in different contexts depends on it.

6.3.2.3 STUDENTS WITH VISUAL IMPAIRMENT AND THE RELATION WITH THEIR PEERS

Students with visual impairment progress curricularly at the same time as they grow personally, which leads them to mature their realities, hence the need for support. The own awareness of their low vision is acquired progressively little by little, as they grow, mature, and lives experiences. It is necessary to accompany them in this assimilation process and respond to the doubts, fears, and concerns that arise throughout their schooling. The support of all the people surrounding them will be key for this process to be carried out naturally and successfully. All educational areas are involved in the inclusion of the student, so we must have in mind that: "just as the student with visual impairment needs to understand and assimilate their low vision and what it entails, their classmates must too. Thus, it is necessary to speak naturally about what it means to have a visual impairment, answer all doubts that may arise, and explain what specific needs their peer has and how they can help them if needed. This process should be guided and cared for throughout schooling, responding at all times to the needs of the group and the

student with visual impairment. One way to make them understand low vision is through a practical exercise in which they themselves can experience blurred or poorly defined vision."[8]

6.4 CURRICULAR ADAPTATIONS

Virtually all (more than 98%) visually impaired students in the three countries analyzed are included in ordinary education. In other words, they attend the same classrooms in the same centers as the rest of normovisual students and follow the official curriculum of the educational level they study. This means, despite the pending work, that they are one of the groups with the highest inclusion rates in the educational field. This is due to the fact that educational centers must offer an adequate response to the educational needs of all their students, with the aim of making it a school for all, adopting the necessary curricular and organizational changes. The objective is to adapt the teaching offered to the characteristics and needs of each student so they can access the ordinary curriculum with the minimum possible modifications.

This topic explores precisely the curricular adaptations that are necessary to adapt the educational context to the student with visual impairment: technical resources, the organization of the environment, the specific procedures in each area to adapt the objectives, contents, methodology, activities, and evaluation. Consequently, we can define curricular adaptations as educational strategies developed to make the teaching-learning process accessible to students with specific educational needs. The ordinary curriculum is modified to respond to the individual needs of the students (in our case those with visual impairment), depending on their characteristics, personal and educational history, motivation and interests, pace, and style of learning.

A curricular adaptation means to adjust the common educational offer to the needs and possibilities of each student, being the adaptation offered to attend the diversity of the students as a consequence of the need to individualize and personalize the teaching-learning processes to meet their needs. Within this purpose, the following principles must be taken into account:

- Principle of standardization: the ultimate reference for any curricular adaptation is the ordinary curriculum. The objectives are to be achieved through a standardized educational process.
- Principle of ecology: curricular adaptation needs to adapt the educational needs of the students to the most immediate context (educational center, environment, group of students, and specific student).
- Principle of significance: curricular adaptation is made within a continuum ranging from the insignificant to the highly significant. Thus, it would begin by modifying the access elements, and continue, if necessary, by adapting the basic elements of the curriculum: evaluation, methodology, etc.
- Principle of reality: for a curricular adaptation to be feasible it is necessary to start with realistic approaches, knowing exactly the resources at hand and our objectives.

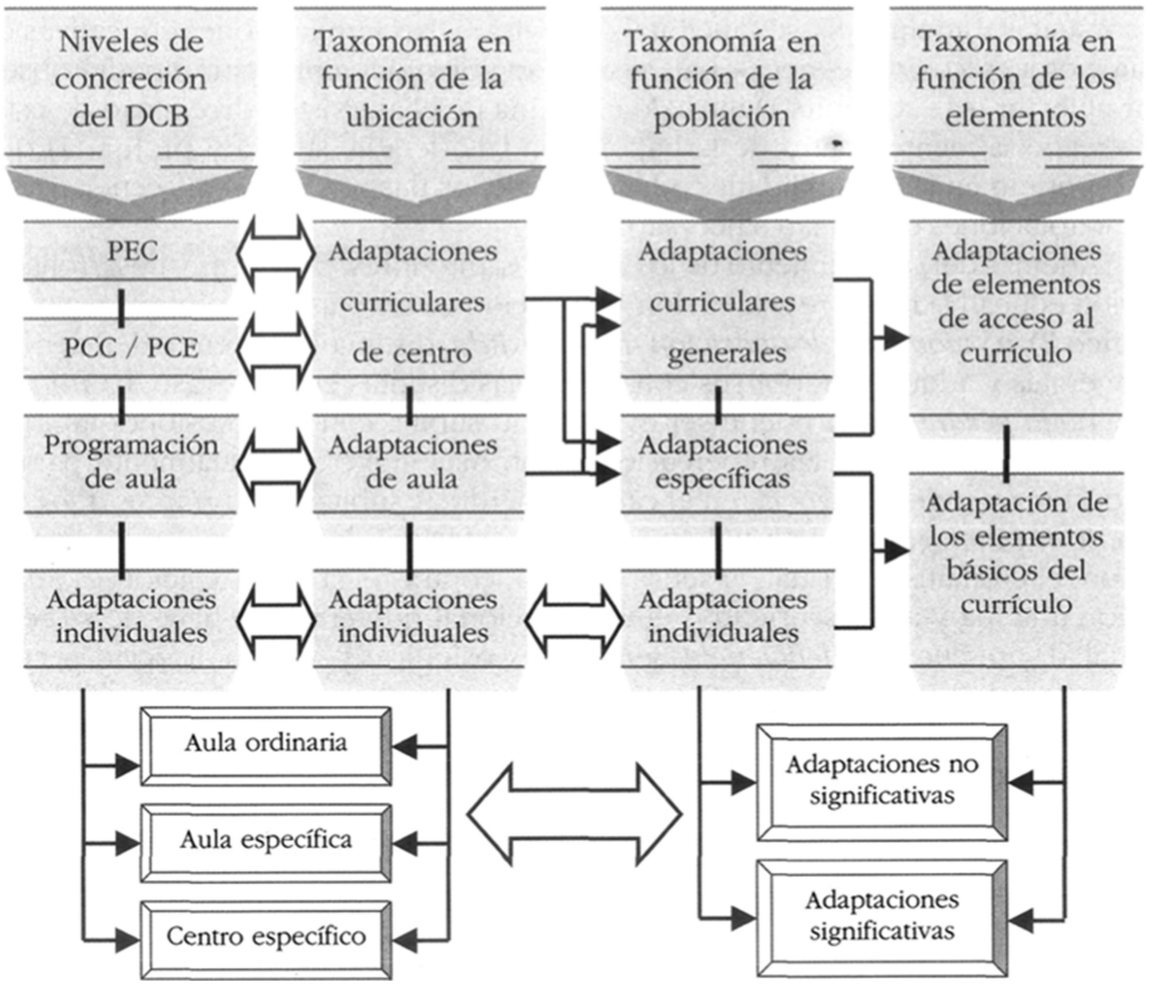
[8] Asociación Española de Aniridia (A.E.A), 2015: El libro blanco de la baja visión en la educación. Guia de la baja Visión.

- Principle of participation and involvement: curricular adaptation is the direct responsibility of the classroom teacher and professionals who work with students with SEN. Decision-making, actions to follow, and the solutions adopted will be agreed upon, with these agreements being reflected in the corresponding adaptation document.

To conclude, this curricular development will facilitate the development of adaptations for children with Albinism and Aniridia, serving as a guide and offering specific and inclusive strategies.

6.4.1 TYPES OF INTERVENTION

As we have seen in its definition, the concept of curricular adaptation is very broad, and starting from it we can speak of different levels of accommodation or adjustments (different levels of curricular adaptation). These actions impact various organizational, functional, material, personal, and curricular aspects based on the psycho-pedagogical evaluation, so they respond to the detected needs. The starting point is the level of curricular competence of the students, unlike old ways of attention to students with SEN, which were based on the deficiency or disability of the student. Thus, curricular adaptations are conceived as a continuum, and can have different taxonomies and nomenclatures:



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Even if they are not incompatible, we have chosen one taxonomy to guide this guide, to avoid confusion, misunderstandings, or even opposite interpretations. To do this, we will take as a reference the classification located in the second column of the previous graph, which distinguishes between adaptations aimed at the school and the context, the classroom, and individual adaptations. We have chosen this classification based on location because it is better adapted to the structure proposed in the DUs.

As for the school and classroom curricular adaptations, we will approach them in greater depth in the following DU (7), since in it we propose the actions of the educational center against low vision, so here we will address the teacher's actions, analyzing individual adaptations. Lastly, remember that the latter must be carried out only after a psycho-pedagogical evaluation and the exhaustive identification of educational needs, so we will present some generic guidelines on them, not being able to delve in depth in the alteration of objectives, contents, or other significant adaptations.

6.4.2 INDIVIDUAL ADAPTATIONS

Individual adaptations are a response to the SEN not covered by the curriculum, and therefore require specific treatment. Those in charge of carrying it out vary, depending on whether we are talking about primary and early or secondary education. In early and primary education, the person in charge is the classroom teacher, along with support teachers and the advice of the educational and psycho-pedagogical guidance team (EPGT). As we pointed out, the development of these adaptations previously goes through the following stages:

a) Individual psycho-pedagogical evaluation for the exhaustive identification of educational needs, which will be determined by individual characteristics.
b) Identification of SEN, which come from the study of the above characteristics and the detection of difficulties and peculiarities shown.
c) Development of specific intervention proposals according to each of the special needs.
d) Application and monitoring of the planned actions.

Therefore, it is easy to understand that it is an individual process, and the risks assumed if choosing generic approaches. Consequently, we will briefly describe below -and as a suggestion- some of the adaptations that may be valid for children with visual impairment, without delving into each of them or each significant individual adaptations, since they depend on individual possibilities.

6.4.2.1 ACCESS ADAPTATIONS

Students with severe visual problems mainly require access adaptations: technical, material, and personal aids that allow them to benefit from a common curriculum. The difficulty of these students is not so much related to the contents to be learned, but rather to the means that the educational system has to teach them. As we have already stated, the collaboration between the competent educational administration (usually the Ministry) and specialized entities (ONCE and its counterparts in the partner countries) allows the centers to be provided with adequate resources.

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- TECHNICAL AND MATERIAL RESOURCES

These are an adaptation of access to information, that is, what type of instruments or activities we should incorporate so students can access at the same time the information provided to their classmates. In order to provide the necessary aids, we need to know all the optical and non-optical aids, ICTs and apps (see DU4) necessary to facilitate access.

Non-optical aids

They refer to "primary and natural" strategies and techniques that don't imply the use of other materials:

- Light: good lighting always improves visibility and therefore visual performance, but not every time light is increased visibility increases. In the case of Albinism, with great photophobia, more light results in visual malfunction. The best is natural light, but without directly illuminating the work table, for example from the sides or sometimes from behind, never from the front. If there is not enough natural light, artificial light can be used through diffuse lighting throughout the room, so it does not produce glare, and also indirect lighting that generates the least shadows that can cause distortions and confusion in the work material.
  The work table can also affect the greater or lesser lighting, thus matte finishes are better than gloss finishes since the former do not produce glare. These considerations must be taken into account both in the classroom and at home.

- Contrast: it is the difference in illumination between two joined objects. With equal lighting, contrast is given by color, since they reflect light; the best contrast is black-white or yellow-black pairs. The use of yellow filters on top of black text and typefaces also favors it; also black ink instead of blue ink pens, soft lead pencils (0 and 1), and notebooks with contrasting pattern can also be helpful.

- Font: the written text used by students with visual impairment must meet a series of requirements that guarantee the best readability, so there are important criteria when choosing a written or handwritten text: clarity (few capital letters), taller than wider text, proper spacing, not too many lines (to be read quickly), and if it is on paper, it should not to be thin (letters from the other side show through, hindering clarity) and be matte (to avoid glare).
  Currently, technological and digital devices like touch screens and tablet devices, facilitate zooming-in text for students with low vision, so font size is less important.

* On the adaptation of illustrations, drawings, photography and texts, we recommend seeing Annex 2: Development and adaptation of materials for students with visual impairment.

Optical aids

The most frequent optical resources are:

- Magnifying lenses: convex lenses mounted on devices that the student places according to their needs; they can be hand-held or with a support. Those with support can be of a fixed focus or

focusable, the former being placed at a comfortable distance for the student and in focusable ones the eye is placed on the lens.

- Absorption lenses or filters: lenses that reduce part of the light spectrum, absorbing ultraviolet light. In cases of severe photophobia, as with Albinism, neutral density filters are recommended, being yellow, orange, or red in color, as it increases contrast. In general, it is an optical aid that favors visual efficiency by reducing glare and improving adaptation to light changes and increasing contrast.
- High contrast magnetic boards: these are illuminated boards used with fluorescent markers that generate a high contrast with the dark background, producing a NEON effect. The board is made up of a crystal that receives LED light or black light from its sides; behind the glass there is a dark surface, so the light reflects illuminating the lines of the fluorescent markers, thus causing a high contrast between the dark background and the illuminated fluorescent colors, looking like Neon lights.

- Messages and drawings are made with special water-based and fluorescent pigment markers, so when the LED board is turned on, the diodes under the frame send light through the glass, reflecting in the marker strokes to create the Neon effect.
  It is a very interesting resource due to its high contrast, but is not common in schools.

Technological and digital aids

DU4 focused on new technologies, the implications of ICTs, and different digital tools as inclusive resources for special education, so we will not repeat it here. We just want to insist that the support technologies currently being implemented in digital classrooms are supplying great advances towards accessibility, inclusion, and standardization for students with low vision linked to Aniridia or Albinism, due to the ability to magnify and zoom on visual information without losing resolution.

- HUMAN RESOURCES

In the process of teaching/learning of students with visual impairment, as we have mentioned previously, all the professionals necessary for the students to successfully carry out specific adaptive measures to access the curriculum must be involved along with the classroom teacher. We must take into account the human resources we have to carry out all the programmed measures and allocate them so the schedules and their timing are established. This assignment of the appropriate professionals (psychologists, pedagogues, support teachers, etc.) will be defined in the adaptation of access (or intervention plan) guaranteeing their participation in a coordinated manner.

Coordination, in the case of pre-primary education, is the responsibility of the classroom teacher in charge of transferring the relevant information to all the staff that works with these students. In this team, the role of the teacher/specialist in the specific team of educational care for people with low vision is essential, and they must actively participate in decisions regarding adaptation. On the other hand, we cannot forget that the family is a key human resource when making the adaptation: they are the ones who best know the specific needs of their children, so they can help the team with decision-making. Thus, it is also important to promote a climate of trust and maintain a fluid relationship, to have the collaboration and support of the Association of Albinism or Aniridia to which the child belongs.

Lastly, the school (discussed in more detail in the next DU) must consider the presence of these students when designing their plan for attention to diversity: when making groups, flexibility of groups, reinforcement groups, etc. they should consider both the "best" group for them and "the most suitable teachers" for it.

6.4.2.2 SPECIFIC CURRICULAR ADAPTATIONS

Among the individualized curricular adaptations that impact the basic elements of the curriculum, we can differentiate between two types: nom-significant and significant:

NON-SIGNIFICANT

These are learning support strategies that impact the objectives, contents, methodology, and evaluation criteria of non-prescriptive elements of the curriculum to adjust the degree of difficulty to the level of competence of the student and their learning style, so they prevent and compensate for the difference; they are an ordinary measure that the classroom teacher can take. These cannot mean a curricular gap of more than two academic years; they affect the methodology (didactic procedures, activities, and materials), evaluation tools, the type of scheduled activities, schedule itself, and organization. These are, for example:

1. Changes in schedule: granting more time to acquire certain knowledge and/or its practice, which is more difficult for students due to their visual impairment; and also includes granting them more time to complete exams.
2. Transversally include certain learning necessary for the student with visual impairment in the curricular content, like spatial concepts (left, right, above, below, etc.), which are of vital importance for their movements.
3. Introducing specific objectives, not part of the ordinary curriculum such as: visual stimulation, the use of technical instruments, learning to use tiflotechnical materials, and activities to develop daily life autonomy.
4. Adaptation of the contents prioritizing some over others, or modifying their order. It is sometimes convenient to eliminate or minimize certain contents that have little margin of accessibility for students with visual impairment.
5. Adaptation of the methodology in terms of organization, teaching procedures, activities, or materials, like an adequate verbalization and description of what is written on the board or displayed on sheets, which will always be necessary; students must be able to manipulate three-dimensional objects or models, using rich language, etc.
6. Adaptation of the evaluation: it will be necessary to modify, adapt, or introduce evaluation techniques or tools other than usual ones, like oral evaluation instead of written tests. Sometimes it will also be necessary to adapt the exam type if it contains several images or text. The Spanish Law allows to give more time to complete exams and general activities to these students.

SIGNIFICANT

These are modifications made from the programming, which impact the prescriptive elements of the official curriculum by modifying general stage objectives, basic contents of the different curricular areas,

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and evaluation criteria. This type of adaptation should not be assigned to students with visual impairment without prior evaluation, since they only have a need derived from their difficulty in accessing the curriculum, for which their corresponding access curriculum adaptation is designed. This would be appropriate in cases where, "in addition to sensory impairment, the student shows other related difficulties". They are mostly extraordinary measures and therefore should not generally be necessary for students with visual impairment.

6.5 DEVELOPMENT OF THE CURRICULAR ADAPTATION

The development of the curricular adaptation for students with low vision -like those with albinism or aniridia- is carried out in the same way as any other for other students with special educational needs. As we have already seen the aspects to take into account to adapt to visually impaired students in the previous section, the task is to create a document that includes all the necessary aspects.

The trend in Europe is that the educational policies that grant the principle of inclusion commit to provide specific support so each student who needs it can access the learning contents in the same conditions as the rest of the students. These supports are included in the specific intervention plan for the student, reflected in the diversity care plan (DCP - as we already pointed out, this intervention plan can have different names depending on the country).

Each educational center has its own models, in compliance with the requirements established by each body with direct competence in educational matters at the state, region, and local level, which ensure compliance with the principle of inclusive education, thus opposing the segregation of students with disabilities -in this case visual impairment- in special education centers.

There is no common model, neither in the different communities/regions, nor in the different European countries with which we collaborate. However, we can conclude that all of them coincide in the data to be taken into account and collected to develop it. The document must always have the signature of the classroom teacher, the educational psychologist, and coupled with the analysis of the academic history and the psycho-pedagogical evaluation reports of the SEN to validate the request to adapt the access to the curriculum. These data are:

INITIAL DATA (all data related to):

- Name of the school.
- Location.
- Name and surname of the student.
- Year that the student is coursing.
- Date of birth and age of the student.
- Name of the parents or guardians, family address and contact phone number.

- Observations: his/her visual acuity and field of view, and in the particular case of students with Albinism, their type of Albinism.
- Name of the classroom teacher.

GENERAL INFORMATION (any relevant personal, clinical, and educational aspects):

- Health problems or difficulties: this includes visual problems and the difficulties they face derived from their condition, which can impact their school learning, such as:
  - Low vision.
  - Absence of peripheral vision.
  - Difficulty to distinguish objects and sources without contrast.
  - Reduced field of view.
  - Impaired visual acuity.

- School problems: difficulties derived from their vision regarding their interaction with the school environment, especially with their teachers and classmates. These include the difficulties they have to distinguish between teachers and classmates, the need for support persons or teachers, etc.
  - Seeing the board and following explanations.
  - Accessing information if it is not previously prepared for their vision.
  - Amount of zoom needed.
  - Use of ICTs to keep up with their peers (screens, tablet devices) …
  - Studying…

- Family and social difficulties: divorced parents, single-parent families… relevant data related to family life and social interaction that influence their school learning.

LEVEL OF COMPETENCES

It involves assessing the level that the visually impaired student reaches in the ordinary curriculum studied at the time of the evaluation. This requires adopting an evaluating perspective eminently focused on each of the areas of the curriculum. In each of the evaluation criteria will be established what the visually impaired student is capable of performing and, as a consequence, the need or type of help derived from them.

- Indicating the contents they have acquired in each area or subject, which ones they are capable of, and the difficulties they have in the course they are.

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COGNITIVE CAPABILITIES AND LEARNING STYLE

It gives information on how children with visual impairment learn. Martínez and Calvo (1997)[9] propose to consider the following variables:

- Variables of the task: how to show information (verbal explanations, graphs…), kinds of tasks (mechanical, perceptual, handling…), and types of responses (graphical, verbal, tactile…). Learning comprehension and generalization strategies.
- Cognitive style before the presentation of tasks and before their resolution; habits and rhythm of work.
- Motivational variables: the student's attitude, their interest in the task, the degree of difficulty they show, etc.
- Social variables: collaboration, participation…

ADAPTATION PROPOSAL

The data is reflected to determine what kind of individualized curricular adaptations (ICAs) will be adopted: access to the curriculum, non-significant, or significant adaptations. In all of them, one must explain the specific answers to basic questions such as: how to teach and evaluate? what objectives should be programmed? what basic competences will be proposed? It must specify all the adaptations of methodology, autonomy, the curriculum, timing and human and material resources that students with Albinism or Aniridia need.

This adaptation proposal will also delve into:

- Those family aspects that are of interest so there is a real and effective participation of tasks proposed in the school and that can be applied to the family context, like carrying out domestic tasks aimed at promoting maximum personal autonomy.
- In school support, the professionals who will intervene in the monitoring will be defined.
- The general lines of action of the classroom teacher, the support teacher specialized in education of students with low vision, and the other professionals who participate in the preparation, monitoring, and evaluation of the ICA will be specified.

It is important to specify that adaptation is carried out due to educational needs derived from conditions of sensory disability that prevent the ordinary access to the educational system. This will also reflect not only a proposal for adaptations at the individual level, but also at the school and classroom levels, as we will see in *Topic 7: Actions of the school against low vision in the early education classroom.*

[9] Calvo A. y Martínez, A (1997). Techniques and procedures to carry out curricular adaptations. Madrid: Escuela Española.

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MONITORING MODELS

The intervention model established will not be permanent, it must be reviewed and adapted according to the visual and educational evolution of the blind or visually impaired student, so periodic monitoring models will be designed based on the initially established intervention model.

- *More curricular adaptation examples and models in Topic 8: Resources for teachers.*

6.6 COLLABORATION OF THE TEACHER WITH THE FAMILY

We already addressed the situations and processes the family faces when they have a child with low vision in Topic 2 of this guide, so we will now analyze what role the family plays in the child's learning and development, in collaboration with the early education school.

Parents play a relevant role in the process of the educational integration and inclusion of students with visual impairment, so it is essential that they realistically accept the visual impairment of the child and its functional consequences. The family is a key piece in the process of socialization, and is also an irreplaceable element for the enhancement of the personal autonomy of the child, for their acceptance of their visual impairment, and for their acquisition of a positive self-concept. Their collaboration with classroom and support teachers is equally essential in school learning, reinforcing at home the educational activity carried out at school. Thus, the family and the school must remain in constant contact and work cooperatively in the same direction. Some of the implications of this collaboration, promoted from the school, are:

- Providing information on the acquisitions that the student makes from a development point of view, so parents can reinforce the learning and generalize it to other contexts.
- Setting common action criteria in the educational and family environment (communication, socialization, daily life skills, leisure…).
- Providing materials while involving them in the development and adaptation and/or search for resources for their child.

Lastly, sometimes progress is slow, small, and even difficult to notice, so it is necessary to tell parents to avoid an attitude of permanent demand.

6.7 ON THE OTHER SIDE OF CURRICULAR DEVELOPMENT

Below, as a summary and to finish this topic, we offer some useful guidelines or recommendations[10] to various aspects of the development, evolution, and inclusion of visually impaired students inside and outside the classroom, aimed at professionals, parents, and the students themselves, with or without visual impairment.

[10] To write these we have taken as reference material: Lafuente de Frutos, A. and Guil Torres, R. (2015). Inclusive education course: visual impairment. Module 4: inclusive education. National Institute of Educational Technologies and Teacher Training (INTEF), Ministry of Education, Government of Spain.

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6.7.1 RECOMMENDATIONS FOR THE WORK INSIDE THE CLASSROOM

- Educate the visually impaired students based on their possibilities and what they can do, respecting their specificity, pace, learning style, and evolution, not focusing on their disability and what they cannot do.
- Visually impaired children are like any other children, they have intellectual and social potential to be developed, they just need you to adapt the information to their way of perceiving the world and respond to their SEN.
- "Visually impaired children are not sighted lacking sight" (Leonhardt, 1992), they perceive the world by organizing it without the information and integration that a full sense of sight provides. Their information will be intermittent, sequential, and fragmentary, so they will need extra stimulation: more sensory, cognitive, and affective elements, that will on the other hand be beneficial for their classmates.
- Explain from the first moment to the classmates and the visually impaired student what low vision means and how they can play, work, and interact with each other.
- Tell every classmate to introduce themselves so the visually impaired child can know them, where they sit, what their voice is like, etc.
- Show them the school environment (classrooms, services, playground), highlighting points of reference.
- Talk to the student before touching or picking them up, to not to scare them.
- When addressing the student, identify yourself with your name; don't play guessing games -who am I?-; also let them know when you leave or change places.
- Teach them to move around the environment safely, autonomously, and effectively.
- Teach them proper personal habits: sitting up correctly, how to call a partner, how to get in line, wait their speaking turn, etc.
- Create a climate of respect and appreciation of the work and the special work techniques used.
- Offer objective information about the world and teach how to demand this information, so they don't accumulate useless concepts (verbalism).
- Teach ordinary gestures: to say yes or no with their head, to shrug, to turn their face towards the person speaking, to raise their hand to ask for speaking turn, etc. All of this contributes to improving their social skills.
- Make the student aware if they have tics or blindisms (rubbing their eyes, waving their arms, moving their head…); they usually repeat them when they are nervous or bored, and don't always know that they are moving. Offer them alternatives to keep them from becoming a habit.
- Involve the child in all the collective activities organized in the classroom; never marginalize them in any activity, find a way to include them in the group.
- Alternate between close and far tasks to avoid tiredness and eyestrain.
- The student should -depending on their understanding and age- know their visual impairment, the name of their disease, their visual acuity, visual field, limitations, and the optical and non-optical aids available that can be used to improve their vision and better respond to their needs. They will improve their ability to use their residual vision at all times and circumstances, improving their performance.

- Help them clarify and interpret what they see, so they are aware of the difference between what they perceive and reality; let them learn to ask for help and use their optical aids without fear of comments.
- Make them aware of their abilities and limitations, so they know how to ask for help without exploiting their deficiency, while also learning to offer help.
- Understand that the student can get tired more than the rest, and that there will be days when they will achieve better results because they see better.
- Hold things close to their eyes to motivate them to look; the more they use vision, the more they will learn to see and develop the cognitive-perceptual process. They must fill their brain with memory and visual images.
- Encourage their visual exploration in open spaces and use the available optical aids.
- Treat them like any other child, congratulating or reprimanding them like others, but keep in mind that approving glances, smiles, and nods are not perceived by them, if not coupled by speaking. Only through physical or verbal contact do they realize that the teacher is looking at them or addressing them.
- Let them know what is written on the board, saying it out loud as you write it. Avoid using words like “here, there, this, or that”, substituting them like “to the right of such number”, “your class is the door next to the one you are knocking on”, “the sheet is to the right of the table”, “stand in front of the chair”, etc. This is also convenient for any student, it improves clarity of presentation and vocabulary.
- Avoid explaining things only with visual characteristics; use other sensory qualities of objects and events.
- Evaluate the student following the same guidelines as with others, but bear in mind that they may take some more time to finish the exercises (or demand less of them).
- Provide adequate lighting, avoiding reflections in the work area. Sit the student near the board, and allow them to approach it to check what is written. Proper lighting -depending on their pathology, their sensitivity to contrast, and adaptation to the amount of light- means less fatigue and better use of the residual vision.
- Reduce the level of noise in the classroom, so speech is not distorted.
- Favor learning through handling real objects, three-dimensional models, relief maps, etc.
- Ensure they use their optical and non-optical aids; sometimes students do not use them out of embarrassment or to not draw attention. Work on these aspects with them and with their classmates.
- Work with the student so they accept their visual impairment.

6.7.2 RECOMMENDATIONS FOR ACTIVITIES OUTSIDE THE CLASSROOM

- Explain the child any noises and sounds around them, both at home and on the street (ambulance sirens, a plate that breaks…).
- Teach them to turn their face towards the speaker; making eye contact if possible with the person you interact with is important to improve social relationships.
- When making gestures or facial expressions, draw the child’s attention to them.

- Give them freedom to move, explore, and touch.
- Name and explain everything they can find on the street: trees, cars, street lamps, animals, sidewalks, traffic lights, phone booths, mailboxes…
- Give them pictures and drawings of familiar things, even if they get very close to see them.
- Teach them to notice the objects they handle and discover their characteristics: color, shape, texture, size, use…
- Provide enough contrast between objects and surfaces: dark colored toys on a white table (and vice versa), a dark pencil on light paper, dark plates for light colored food, etc.
- Show them common use tools and objects at home, the place where they are kept, and their use.
- Name the clothing items you wear, where they are placed on the body, how they are arranged, how they are folded, etc.
- Let them learn to do things for themselves: wash their hands, take off shoes, pick up their toys, etc. Everything they can do by themselves, even if they have to spend a lot of time, they should do it without help. This is important for their self-esteem and the development of autonomy and independence.
- Don't overprotect them; the child is able to do things just like others, you just have to teach them how. Overprotection creates dependence, limits motor and exploratory activities, and delays the development of many skills.
- It is essential that they interact with other children and learn to share things.
- Encourage them to tell things they have experienced to avoid verbalism, what they have done in school, what games they have played, etc.

6.8 ACTIVITIES

ACTIVITY 1 - Test what you have learned; reflect on the following statements and find out the answer:

1. What percentage of students with visual impairment are currently signed up in ordinary schools?
   a) More than 95%, as long as they have a residual vision.
   b) More than 98%.
   c) Less than 5%.
   d) All visually impaired students are enrolled in ordinary schools.

2. A visually impaired student has a slower learning rate due to:
   a) their lesser cognitive development.
   b) their slower perceptual channels.
   c) decreased motivation, so their pace slows down.
   d) carrying out activities slower, for safety.

3. What areas are part of the specific curriculum of the visually impaired early education student?
   a) Orientation and mobility.
   b) Visual stimulation.
   c) Math.
   d) a) and b) are both correct.

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4. Which of the following are SEN as a consequence of low vision?
   a) The need to use technical aids to access printed literacy.
   b) The need for an education and stimulation of the residual vision that maximizes its functionality.
   c) The need to develop social skills and promote their social integration.
   d) All of the above are correct.

5. Which of the following objects is not an optical aid?
   a) Lectern.
   b) Magnifying glass.
   c) Glasses.
   d) Magnetic board.

6. Are technological and digital aids an adaptation to access the curriculum?
   a) Yes.
   b) No, they are a curricular adaptation.
   c) They are not an intervention considered within adaptations.
   d) Only if the student has a residual vision.

7. Regarding the evaluation of the visually impaired student:
   a) It must be the same for everyone.
   b) They should not be evaluated because they learn like others.
   c) They should be given more time to complete tests, since their use of the access material is slower.
   d) They should be given more exercises than the rest because they have technical and tiflotechnical resources that grant them more speed and information.

8. If we eliminate contents with little margin of accessibility for students with visual impairment of the educational curriculum of a student with visual impairment, what type of adaptation are we doing?
   a) An access adaptation.
   b) A significant adaptation.
   c) A non-significant adaptation.
   d) None of the above.

9. If we test a student with visual impairment in an oral examination, what type of adaptation are we doing?
   a) An access adaptation.
   b) A significant adaptation.
   c) A non-significant adaptation.
   d) None of the above.

10. When is it convenient to make a significant curricular adaptation?
    a) Only in cases where, in addition to visual impairment, there are other related difficulties.
    b) Never for students with residual vision.
    c) Always.
    d) None of the above.

ACTIVITY 2 - If you had to develop out a non-significant curricular adaptation proposal for a 3-year-old student with Aniridia or Albinism (residual vision of 20%) that begins the second cycle of pre-primary education, what adaptations of objectives, methodology, schedule, and evaluation would it have?

Keep in mind that we should do an initial evaluation beforehand, to identify the needs of the student and adapt these elements.

It may help you to answer the following questions: when to teach? how to teach? the answers can provide you with the necessary guidance to develop the individualized adaptations in the basic elements of the curriculum (not significant).

Send us your proposal of non-significant curricular adaptation through the e-learning platform and the partner entities and experts in the classroom teaching team will evaluate, correct, and help you in the adaptation.

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ANNEX 1 - SPECIFIC BASIC COMPETENCES FOR LOW VISION IN PRE-PRIMARY EDUCATION, 160 ITEMS

Given the complexity of the topic to be analyzed, and to facilitate locating each area at any time, we have organized the information by areas of intervention (early care, basic instrumental techniques, personal autonomy, social competences, and tiflotechnology). To do this, the competences defined in the official curriculum of each partner country (Norway, Italy, and Spain) have been considered, and also others that, although outside the official curriculum, have been established as priority by the professionals specialized in the education of people with visual impairment.

PERSONAL AUTONOMY AREA

The following competences should be acquired by all children with visual impairment -both blind and with low vision- by age 6, the only difference being the methodology used for their acquisition.

A. GROOMING AND PERSONAL HYGIENE:

1. Using the toilet (lifting the lid, using paper, proper cleaning, and flushing).
2. Washing their hands and face (turning on the tap, taking water to their face, proper use of soap, locating and using the towel correctly).
3. Brushing their teeth.
4. Combing their hair.
5. Using a tissue (taking out a tissue from the package, blowing their nose…).

B. DRESSING AND PERSONAL ARRANGEMENT:

6. Identifying the different clothes and their parts.
7. Putting on open clothes (with zippers or buttons) and closed clothes (t-shirts, jerseys…) on their own.
8. Putting on underwear on their own.
9. The child fastens and unfastens velcro and automatics on their own.
10. They put on and take off their coat, hang it, and takes it off the hanger, so they have to locate their hanger with a clear and precise reference, and also know how to aim their clothing with the label or tape it has.
11. They identify different types of footwear.
12. They put on their shoes on each correct foot.
13. They unfasten and remove velcro shoes.
14. They take off all clothes.

C. DEVELOPMENT AND BEHAVIOR AT THE TABLE:

15. They keep a correct body posture.
16. They look for and locate supplies appropriately.
17. They locate food on the plate.
18. They use the spoon properly.
19. They use the fork to prick food.
20. They use the napkin properly.

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21. They have an appropriate behavior (chewing with the mouth closed, etc.).

D. HANDLING SKILLS:

22. They locate and use trash cans.
23. They unwrap objects (sandwiches, candies, wrapped gifts…).
24. They open a yogurt.
25. They open and drink juice by inserting the straw into place.
26. They unscrew/screw caps and plugs.
27. They insert and remove keys from a lock.
28. They turn on and off things with remote controls (TV, music system…).
29. They locate and identify the on/off button in audiovisual devices.
30. They put away their glasses.

E. HOUSEHOLD TASKS:

31. They pick up toys and entertainment games when finished playing.
32. They order school supplies.
33. They put dirty clothes in their place.

F. ORIENTATION AND MOBILITY:

34. They use exploration techniques to locate objects (visual or tactile tracking).
35. They stand at the table to work and eat.
36. They position themselves in front of the stairs to go up or down.
37. They use techniques to locate obstacles when traveling (visual information, echo-location, sound shadow).
38. They use techniques to walk in a straight line (visual information, echo-location, sound shadow).
39. They use clues and reference points for orientation (known objects, sounds, smells).
40. They move around their house and around their classroom on their own.
41. They are accompanied by a sighted guide in unknown places.

SOCIAL COMPETENCES AREA

Social competence is a specific and priority basic competence for the development of people with low vision.

A. SOCIAL SKILLS:

Nonverbal skills

42. Listening actively.
43. Keeping a correct body posture in different situations (when getting up, sitting in a chair, when walking…).
44. Keeping the head upright.
45. Maintaining proper eye contact, or directing the face towards the other person.
46. Showing facial expressions appropriate to the situation and their feelings.

47. Knowing and using basic conventional gestures at different times (nodding to agree or deny, saying goodbye with the hand, pointing, etc.).
48. Beginning to control their stereotyping.
49. They have acquired the symbolic game.

Verbal skills

50. Saying hello and goodbye.
51. Showing initiative to start interactions (with adults and peers).
52. Having dialogues typical of their age.
53. Knowing how to ask for help and to thank it.
54. Asking questions based on their interests.

Cooperative skills

55. Asking for and accepting help in situations that require it.
56. Participating, led by the teacher, in activities with their classmates.
57. Participating, led by an adult, in keeping clean and orderly environments.

Social regulation standards

58. Knowing and respecting the rules of the school environment.
59. Starts knowing and respecting the rules of their immediate social environment.
60. Seeking approval from their social environment.

Game and leisure skills

61. Playing games appropriate to their age or stage of development.
62. Taking part in games with other children around their age.
63. Expressing interest in joining recreational games.
64. Following the rules of games.
65. Properly accepts when losing in games.
66. Participating in extracurricular activities appropriate to their age and abilities.

Assertiveness

67. Recognizing and expressing their own feelings.
68. Beginning to control their feelings and emotions progressively.
69. Expressing affection towards people in their immediate environment.
70. Reacting normally to unfamiliar or fearful situations.
71. Having a good image of oneself.

Classroom skills

72. Initiating request rules and waiting for the turn to speak.
73. Assuming responsibilities appropriate to their age.
74. Requesting the teacher's attention correctly.
75. Realizing the difficulties of their classmates.

B. ADJUSTMENT TO DISABILITY:

76. Using the appropriate resources according to the needs generated by their disability.
77. Knowing that their way of perceiving is different.
78. Accepting the personal help they need.
79. Asking for help when they need it.
80. Relating to equals with and without disabilities.

C. SEXUAL EDUCATION:

81. Experiencing pleasant sensations through self-exploration and contact (caresses, kisses, hugs…) with people in their environment.
82. Locating and identifying the different parts of their body.
83. Showing curiosity to know the body of others.
84. Recognizing different personal traits based on sex.
85. Is interested in knowing the origin of children, pregnancy, and birth.

AREA OF BASIC INSTRUMENTAL TECHNIQUES

Before starting primary education, it is convenient for students with blindness or low vision to have developed the following specific competences in addition to those that, without being specific, are considered essential to achieve equal conditions with the rest of their peers.

A. PREREQUISITES:

Auditory development

86. Perceiving, identifying, discriminating, and memorizing familiar sounds (from home), their immediate environment (street, toys, swings), school-related (letters, words…) worked by their group of reference.
87. Retaining and repeating simple sentences, songs, poems, and short stories.

Space-time orientation

88. Knowing basic spatial notions (inside/outside; above/below/in the middle; in front/back; on/under; near/far; right/left).
89. Managing basic temporal notions (before/after; yesterday/today/tomorrow…).
90. Ordering simple time sequences.

Oral expression

91. Using vocabulary of their age in a significant way, associated to real experiences.
92. Transmitting their basic needs and personal experiences to peers and adults.

General Psychomotricity

93. Has internalized the body scheme.
94. Keeps proper balance and control of muscle tone and posture.

95. Is aware of the mobility and functional independence of the different parts of the body: head, trunk, and limbs.
96. Knows the name and location of the different parts of the body.
97. Has coordination and dissociation of arms, legs, and hands.
98. Has defined laterality.

Rhythm

99. Has acquired the notion of intensity (strong/weak).
100. Has acquired the notion of speed (fast/normal/slow).
101. Reproduces simple rhythmic structures.

Fine motor skills

102. Threads, tears and wrinkles paper, pastes, models with clay, cuts with scissors…
103. Has acquired coordination and dissociation of the fingers (can use writing grip).

Graphomotricity

104. Colors, goes over lines, and draws lines and curves with the proper direction (free drawing).
105. Knows how to trace outlines from the outside and the inside.
106. Reproduces basic geometric shapes and simple drawings.
107. Draws the human figure in a simple way (stick persons).
108. Draws basic numbers and letters.

B. LITERACY, PRINTED MATERIALS AND AUDIO:

Once the literacy code that the student will use is established.

Printed materials:

109. Keeps a body posture and distance appropriate to their visual ability when writing or drawing.
110. Picks up the pencil correctly.

** Although the competences acquired must be the same as those of children without visual impairment, it is necessary to insist on activities related to visual perception, and to keep in mind the different access adaptations specific to each student according to their visual condition (font size, work distance, contrast, lighting, etc.).*

Audio:

111. Listens carefully and understands stories and narrations.
112. Listens and memorizes songs appropriate to their age.

** At this level, regardless of the code used by the student, it is recommended to carry out activities to develop hearing-related skills: attention, concentration, understanding, memorization…*

C. HANDLING SKILLS:

113. Does well-organized hand movements to explore the immediate environment.
114. Has good finger-hand coordination.
115. Differentiates textures, temperature, basic shapes and sizes, weight, etc.
116. Orderly explores simple relief representations of known objects (stars, houses, trees, other geometric figures…).

D. SPECIFIC SIGNS:

117. Knows and uses mathematical signs typical of this stage (number signs, "plus", "minus", and "equal to").

E. STUDY AND WORK TECHNIQUES:

118. Recognizes and knows how to organize their work material.

TIFLOTECHNOLOGY AREA

A. TIFLOTECHNICAL ADAPTATIONS:

► Hardware

Daisy desktop/portable player

119. Locates the on/off button.
120. Inserts and removes CDs.
121. Knows how to listen and understand the tales at their level.

► Software[11]

Magnifier[12]

122. Starts the screen scan with the mouse and the magnifier (left/right, up/down…).

Tales and educational games

123. Knows how to locate and use the keys to explore the story/game (Ctrl, guidance keys, etc.).
124. Listens to and understands contents at their level.

B. OTHER ALTERNATIVES IN THE MARKET

► Hardware[13]

Digitizer tablet, dance mat, push button, touch screen/ tablet PC.

[11] Interaction with the software must always be guided by an adult.
[12] The magnifier should only be used if the visual situation of the student makes it essential, because the accessibility options of the operating system will be prioritized. The magnifier options will be activated automatically according to the needs of the student after intervention by the tiflotechnical specialist (pointer and/or magnification).
[13] Interaction with the hardware must always be guided by an adult.

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125. Knows how to use alternative accesses to standard programs and games (digitizer tablet, push button, touch screen or tablet PC), if they cannot interact correctly with the software, the mouse, or the keyboard.

Keyboard/ extended keyboard

126. Initiation to the keyboard as a game.
127. Basic keys: space bar, enter, cursor arrows, tab.
128. Alphanumerical keyboard (basic letters).

Mouse

129. Knows and uses the concepts of the previous stage (0-3 years).
130. Starts learning other mouse controls (double click, drag and drop) and strategies to locate the mouse pointer and explore the screen (tracking).

Interactive digital board

131. Knows how to press and use it to access the proposed games or activities.
132. If there is a screen connected to the PDI in their place, they understand and use it to see the explanation the teacher makes on the board.

► Software

Tales, songs, and educational games (J-clic, educational platforms, etc.)

133. Knows how to use the space bar, enter, tab keys, ctrl, etc.
134. Knows how to listen to and understand the contents at their level.
135. Uses the alphanumeric keyboard to write letters or words at their level.

C. SPECIFIC LEARNING

136. Knows and uses the concepts of the previous stage (0-3 years).
137. Knows and uses visual concepts (EVO, EFIVIS, J-clic, and other games that allow working on these specific concepts).

Color

138. Paints following a pattern of established colors.
139. Matches different objects of the same color.
140. Recognizes colors following audio instructions.
141. Finds the color that matches a model.

Visual field

142. Differentiates the size of objects.
143. Is aware of the appearance of objects on the screen; locates objects.
144. Discovers objects using tunnel vision simulation; track trajectories.

Perception

145. Recognizes and identifies objects and symbols: faces, people, and drawings.
146. Differentiates simple inner details: internal and external differences and similarities.
147. Has visual memory.
148. Has sight-movement coordination.
149. Copies from drawings, lines, and shapes.
150. Has defined laterality.
151. Perceives partially visible simple objects.
152. Does simple puzzles.
153. Classifies known objects.

Visual perception

154. Differentiates figures from the background.
155. Differentiates parts from the whole.

Tracking

156. Visually explores the screen.
157. Tracks orderly (left-right, up-down), using games that facilitate and motivate them to do it.

Hearing comprehension

158. Listens to and understands stories with human voices.
159. Listens to and understands songs.
160. Listens to, understands, and differentiates sounds (animals, human sounds, transport…).

ANNEX 2 - DEVELOPMENT AND ADAPTATION OF PRE-PRIMARY EDUCATION MATERIAL FOR STUDENTS WITH VISUAL IMPAIRMENT.

One of the tasks of support teachers regarding the integrated education of students with visual disabilities and blindness is to anticipate and respond to the needs for the development and adaptation of the materials they require. To do this, teachers will need to know these needs in advance, to adapt or elaborate the materials with enough time, so the students have them available in time, as their classmates.

The teacher must provide the support teacher with the texts to be transcribed into braille with enough time in advance for the transcription process. He/she does not only have to adapt or develop various materials that can be perceived by touch, but they will also provide advice and training to the teacher in this regard. The ultimate goal is for the student's own teachers to generate the materials they need based on our guidelines and basic adaptation criteria.

Let's look at some of these material adaptation criteria.

MATERIAL ADAPTATION CRITERIA (FOR LOW VISION)

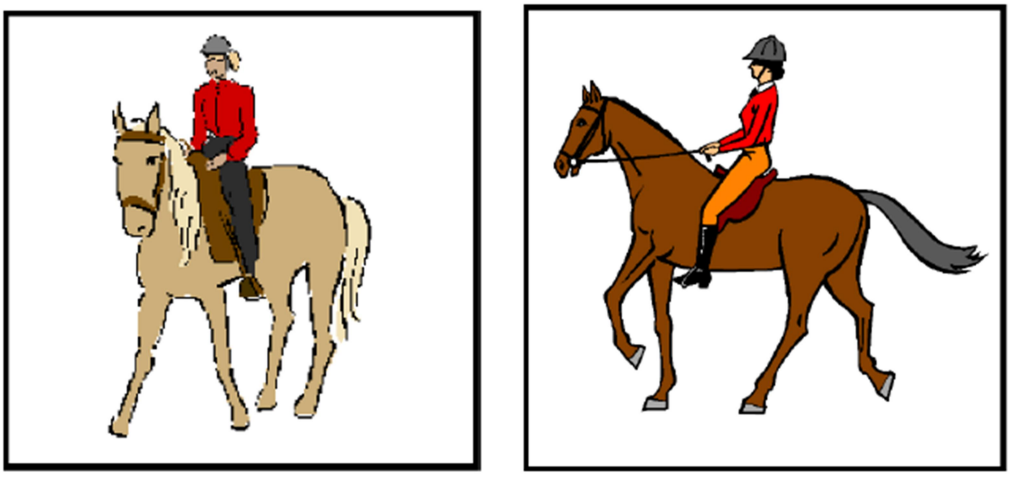
María del Mar Díez Álvarez and Esteve Bellini y Cortés, specialists in the adaptation of materials in relief from Barcelona Bibliographic Production Center, point out that the adaptations required by students with functional remaining vision are those that:

- Facilitate their access to printed materials.
- Are based on sight.
- Allow them to make the most of their remaining vision.

ADAPTATION OF ILLUSTRATIONS, DRAWINGS AND PICTURES

Following the indications of Elena Gastón from ACCEDO group (Accessibility to ONCE Educational Content), the following criteria will be considered to adapt illustrations, drawings, and pictures:

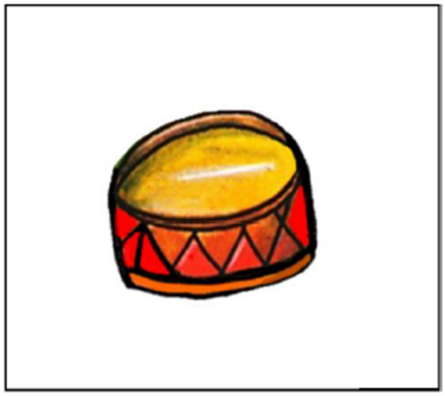
1. They show clear shapes based on the child's experience, interests and needs.



Of the two drawings, the right one is more suitable, since the contour lines are clearer, there is a good contrast of colors with the background and between the figures (the horse and the rider). The position of the horse and rider from the side is very clear.

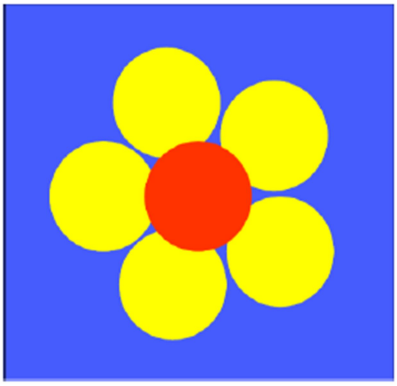
In the drawing on the left, contour lines are not continuous, all parts of the horse are not well shown (the tail is partially hidden and glued to the back of the horse), and the rider is not clearly distinguishable.

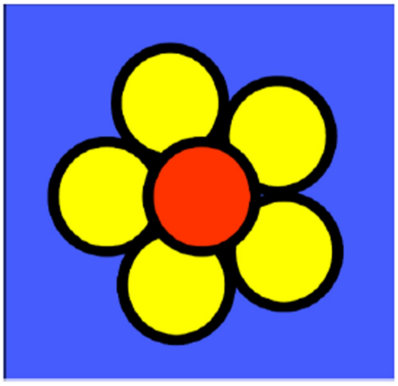
2. They show isolated shapes, drawings, or pictures, avoiding overcrowding.



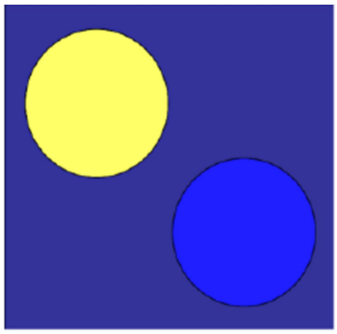
3. They need to have a good shape-background contrast.

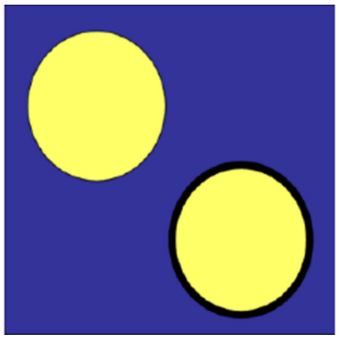
4. They have to highlight the contour in a thick line to increase the differentiation of shapes.





5. They need to show contrasting colors.





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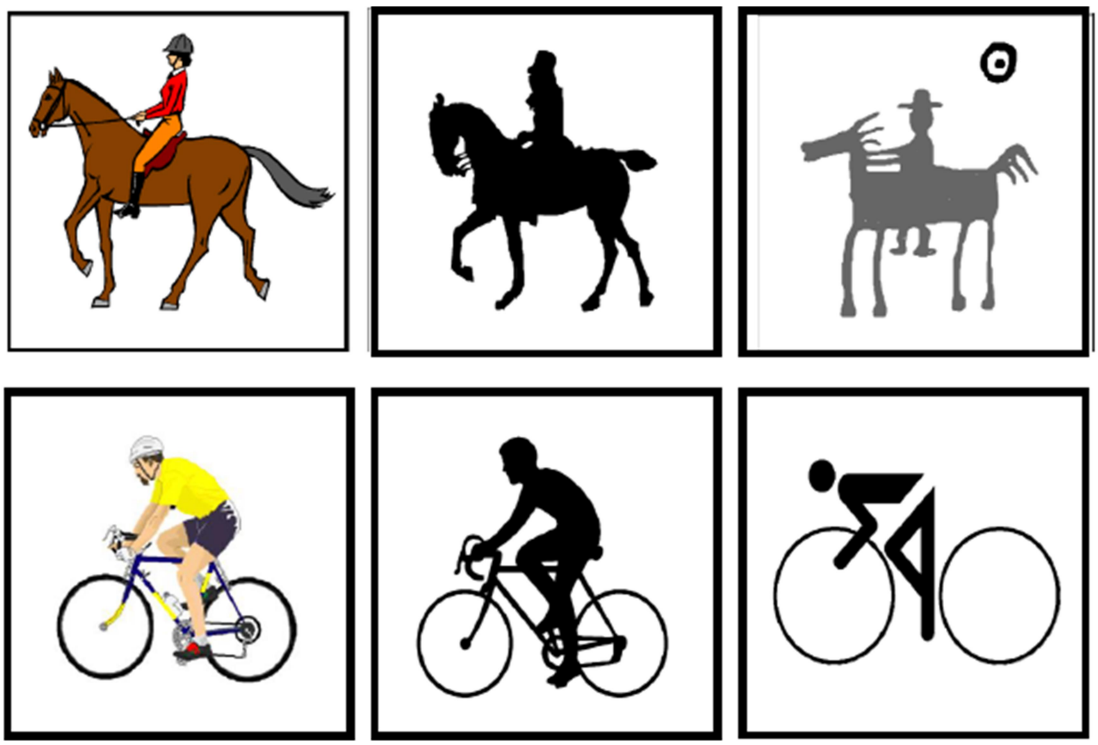
6. They should follow an abstraction hierarchy.

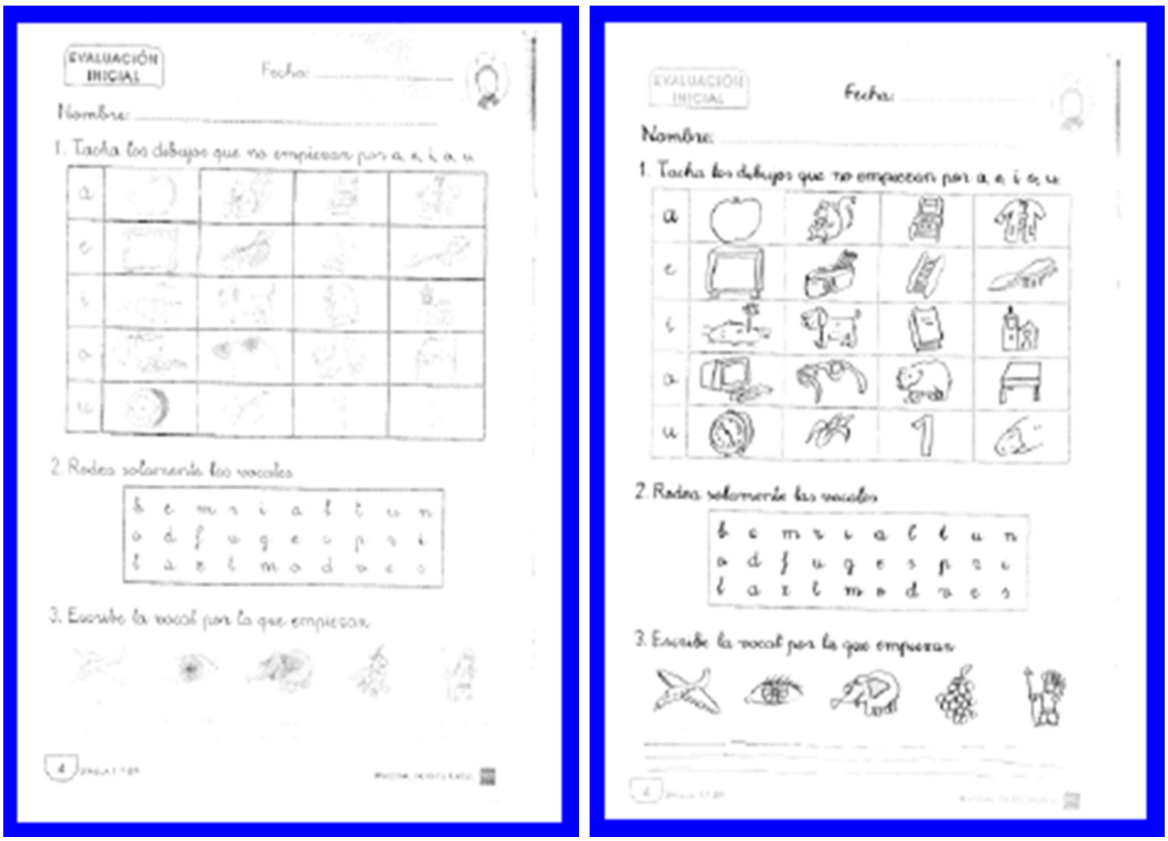


ADAPTATION OF TEXTS

In posters, signs, or text adaptations, the best contrast is provided by the combination of the following colors:

BLACK ON WHITE	WHITE ON BLACK
YELLOW ON BLACK	WHITE ON BLUE
WHITE ON RED	BLUE ON WHITE
RED ON WHITE	YELLOW ON GREEN

Another important adaptation is to highlight contours with markers to increase differentiation of the shapes. Teachers frequently photocopy tasks supplementary to the books for the students, usually made with a low ink level, so their contrast and differentiation between shapes is difficult to perceive by students with low vision. Highlighting contours facilitates the child's work and avoids visual fatigue, so the teacher must be given the appropriate guidelines for them to have this in mind.



In most projects of different publishers, the pre-written paths and/or the lines that the student has to follow to draw letters and numbers are usually printed a discontinuous line in a very light gray, barely perceptible for children with low vision. The teacher should highlight these lines with a fine-tip black marker or pen to make them more noticeable.

MATERIAL ADAPTATION CRITERIA (LOW VISION AND BLINDNESS)

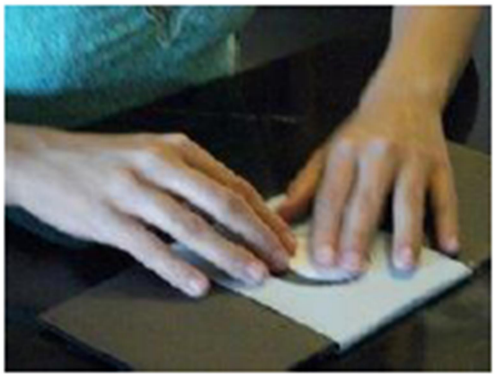
PICTURES IN RELIEF

Educational books and projects most often feature a large volume of drawings, pictures, and graphics. Touch provides additional information to what the child with low vision can perceive with their eyes, so reinforcing the visual stimulus with the haptic stimulus provided by different materials and textures on the surfaces, streamlines and enriches the perception of children with visual remains. In this sense, it is essential to train the use of touch as early as possible, both for children with low vision whose literacy code will possibly be Braille, and also for blind children, since this training will facilitate the process of accessing this system and the interpretation of maps, plans, and graphics in relief.

We will follow the instructions of the specialists in adaptation of materials in relief from Bibliographic Production Center of Barcelona, María del Mar Díez Álvarez and Esteve Bellini y Cortés for the design of relief illustrations:

PICTURE: in relief, texturized, and full-color.

SIZE: wide enough to be touched by both hands.



SHAPE: simple details, with one relevant characteristic to identify the shape or character.

OUTLINE OF THE FIGURES: clear, without overlapping objects. Must be clearly defined to allow easy identification and differentiation.

PERSPECTIVE: (depth) a concept to be avoided in materials in relief, due to its difficulty in representation and understanding.

COLOR: try to use plain or basic colors, easily recognizable with tone contrast.

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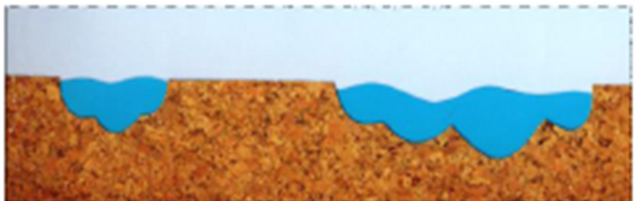
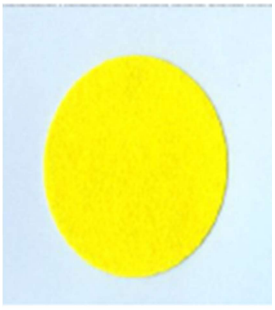
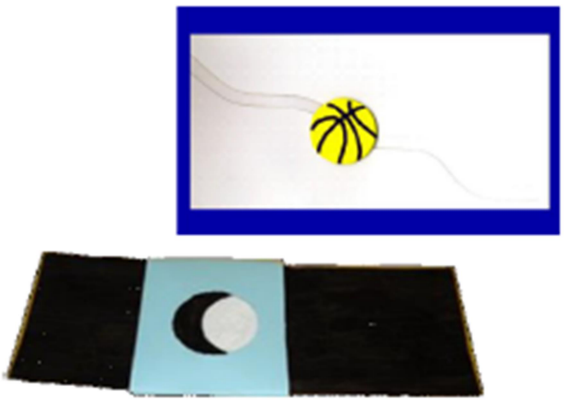
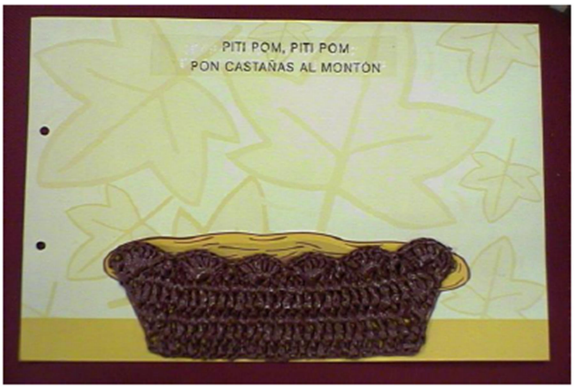
TEXTURE: fill the whole figure with the same texture to delimitate it and allow an easy identification. 	TEXTURE: use textures that remind of the real sensation of what is represented (for example plastic, a cold, smooth sensation for water or metals). 
CORK: irregular, not very hard. For earth, mountains, the earth's crust, etc. 	SANDPAPER: a rough, unappealing sensation. For fire, the sun, lightning, and very hot materials. 
WOOD: for trees and wooden objects (furniture). 	FABRIC OR CLOTH: smooth and delicate sensation. For clouds, smoke, and dreamed representations. 
MOBILE PIECES: these can also be included. 	

MATERIAL ADAPTATION CRITERIA (BLINDNESS)

HAPTIC SHEETS OR CARDS

1. When making this adaptation, try to simplify the sheet, reproduce few elements, and always just those most relevant to achieve the objectives.



In the case of this card, only the basket in which the child had to put chestnuts has been reproduced.

The leaves adorning the background of the card do not provide information to blind children, and if reproduced they will only lead to confusion.

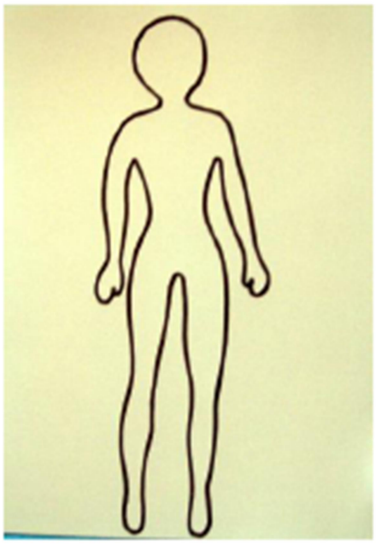
2. Simplicity in shapes, avoiding complex elements and visual details that do not provide tactile information.

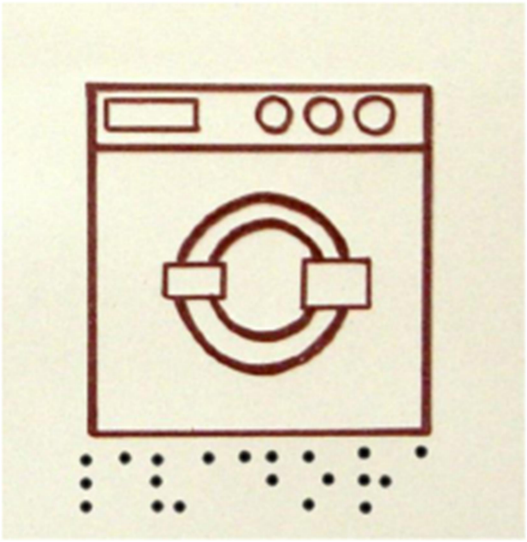
3. Use highly differentiated textures as long as tactile refinement is not specifically being worked on.

4. Make sure the reliefs are not too bulky.

5. Fuser film sheets: they are made of special materials with microcapsules which, when exposed to strong heat (fuser oven), raises the lines or patterns drawn in the sheet. The element to be represented in relief is drawn on a blank sheet of paper, marking the relevant lines of the object or drawing. The thicker the line, the higher its elevation will be.

   Once the drawing is made, it is photocopied on the fuser sheet and passed through the oven. The elevation resulting from the marked lines can be explored by the child by touch.





Guidelines for fuser drawings:

- The background of the image must be white, since we want the outlines and filler of the image (frames, lines…) to be differentiated and stand out, so the child can explore them. With a dark background, there would be no difference between it and the outlines, since both elements would be raised in relief.
- Simplify the drawings and eliminate irrelevant elements that may create confusion.
- Do not overlap objects.
- The drawings should be an adequate size (not very big or very small), so the child can both cover it with their hands but also differentiate its details.
- Transcribe any texts into braille.
- Try not to draw two lines too close together.
- Put a name or title on the sheet so the student knows the position in which to explore it.
- Do not represent perspective or depth.
- Keep a constant and coherent scale for the objects represented.

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Looking out for a School for All

COURSE FOR
PRE-PRIMARY SCHOOL
TEACHERS

DIDACTIC UNIT 7

ACTIONS OF THE SCHOOL FACING LOW VISION IN PRE-PRIMARY CLASSROOMS

Looking out for a School for All

This is the educational material uploaded to VIRTUAL INCLUSIVE EDUCATION and developed by REDTREE MAKING PROJECTS in collaboration with SMALLCODES SRL, ASOCIACIÓN ALBA, ANIRIDIA EUROPE, ANIRIDIA NORGE, and ANIRIDIA ITALIANA within the project “LOOKING OUT FOR A SCHOOL FOR ALL: EARLY EDUCATIONAL INCLUSION FOR STUDENTS WITH LOW VISION”, co-funded by the ERASMUS PLUS PROGRAMME OF THE EUROPEAN UNION.

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This project has been funded with support from the European Commission.
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COURSE FOR PRE-PRIMARY SCHOOL TEACHERS

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"All children begin their school careers with bright imaginations, fertile minds, and a willingness to take risks with what they think."

- Ken Robinson

OBJECTIVES OF THE DIDACTIC UNIT

At the end of this Didactic Unit, you will be able to:

- Know the evolution of the concept of inclusive education in Europe.
- Understand the regulatory tool of the Plan for Attention to Diversity (**PAD**).
- Identify the most relevant needs of access to the school and classroom for children with low vision, and apply the inherent curricular adaptations.
- Classify the rest of the modalities of curricular adaptations for pre-primary students with visual impairment, seen in topic 6.
- Apply the basic guidelines for didactic intervention, from an adaptation perspective, to the visual characteristics of the students.
- Appreciate the work carried out by the entities of beneficiaries in collaboration with schools throughout the learning process of students with visual impairment.
- Raise awareness on the treatment of diversity to guide the education of children with low vision.

INTRODUCTION

Based on the legislative framework on inclusive education, which we already saw in the first topic, and on the theoretical foundation that heads the work of this entire course, we know that it is possible to speak about the first steps towards attention to diversity -in Europe- around 1960, when the concept of standardization was born in Nordic countries. Although it is true that the key element of these reforms in

the European educational systems that led to its implementation was the Warnock report (1978)[1]. Thanks to this report, we began to talk about special education within ordinary centers, and it was later when "inclusive education" took place, turning out to be the third element that favored an egalitarian, participative, and non-discriminatory education.

All these small steps that slowly took place in different EU countries gave rise to what we now understand as Attention to Diversity; an approach that, to a certain extent, has always been supported by UNESCO and the UN, which have promoted education for every person as a fundamental right. Also, in the last two decades, the trajectory of the EU has been marked by the development of policies in favor of both social and educational inclusion, to support inclusive education, integrating students with SEN within of the ordinary education system.

Sticking to the described regulatory framework, we will address the PAD as a tool to regulate the environment through which the guidelines, strategies, and actions that enable inclusive education criteria are structured. Then we will approach the curricular adaptations of the school and the classroom for the case at hand -children with low vision in pre-primary classrooms- through the specific guidelines to have in the creation of a PAD.

Lastly, to end this more theoretical section, we will analyze the role played by the associations of beneficiaries -specifically of Albinism and Aniridia- in a more practical way, through experiences in the teaching processes, collaborating with schools from local to European level.

7.1 PLAN OF ATTENTION TO DIVERSITY (PAD)

On December 13th 2006, the resolution of the UN Convention on the Rights of Persons with Disabilities was approved, recognizing in article 24 the right of persons with disabilities to education, and with the objective of realizing this right without discrimination and on the basis of equal opportunities, the signing Countries will ensure an inclusive education system at all levels, of high quality and free of charge, on equal terms with the rest of the students, in the community where they live. To do this reasonable adjustments must be made within the general education system -depending on individual needs- to provide the necessary support to students with visual disabilities (in our case related to Albinism or Aniridia), facilitating personalized and effective support measures in educational settings that maximize academic and social development, in accordance with the objective of full inclusion.

As we know, the school is generally the place where children will spend the most time; because of this, and to create more inclusive environments, its design and adaptation must consider criteria of total

[1] The Warnock Report is a document produced by the British Education Commission, commissioned in 1974 by the UK Secretary for Education to this entity chaired by Helen Mary Warnock, a British philosopher specialized in education, and published in 1978.
This commission was created to "study the educational benefits for children and youth with disabilities in England, Scotland, and Wales", referring to the SEN children. One of its main premises is the fact that all children have the right to be educated.

accessibility. The context around which the guidelines, strategies, and actions that enable these criteria and allow intervention on the reality we are dealing with are what forms the PAD. As an integral part of the educational project of the school, the main objective of the PAD is to achieve an individualized and high quality education for every student, and especially for those with specific educational support needs (SESN). The PAD is therefore the document that includes the set of actions (adaptations of the curriculum, organizational measures, and supports and reinforcements) that a school designs, selects, and implements to provide a response tailored to the general and particular educational needs of all students.

It must specify the current analysis and reality of the school, determine the objectives to be achieved, the measures to be carried out, the human, material, and didactic resources to be used temporarily or permanently, and monitoring, evaluation, and review procedures. It must match the hallmarks of the school itself, so if the values promoted by the school are inclusive, the PAD must also be so, always supporting general measures in the daily life of the school. These measures must be ordinary and regular, basically meaning organizational and methodological strategies, and curricular and social measures that respect the different learning paces of the students, favor the ability to learn on their own, and promote teamwork.

The PAD is part of the yearly general program, which responds to the principles of equality, equity, and educational inclusion as main. Thus, it is a coordinated, planned, and agreed document with yearly specifications of said programming. It should also be open and flexible, to adapt to the context, resulting in a concrete and useful document aimed to provide an inclusive response to all students, which grants the school inclusive measures for every student from an inclusive perspective.

Lastly, it should be added that the process of developing this plan will be promoted by the management team of each school via the joint reflection of all teachers, and it will be reviewed at the beginning of each school year in accordance with the analysis of the starting situation and assessment of the foreseeable needs related to the type of students and the educational offer of the school and to the existing resources to provide measures of attention to diversity.

7.2 SPECIFIC GUIDELINES TO CONSIDER FOR THE DEVELOPMENT OF THE P.A.D. IN SCHOOLS WITH STUDENTS WITH VISUAL IMPAIRMENT

When speaking of specific guidelines to consider for the development of a PAD for students with visual impairment, we refer to the developed educational strategies that make the teaching-learning process accessible to them. These guidelines attempt to respond to the individual needs generally shown by students with Albinism or Aniridia, taking into account their personal educational history, motivation and interest, pace, and learning style. Therefore, they are specific measures that try to adjust the educational context (access to the school and the classroom), and the adaptation of the ordinary curriculum to the needs and possibilities of the students in an individualized and inclusive way.

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Having explained in the previous topic (DU6) the reality of the students with visual impairment in the classroom and their SEN, the next step is to determine the adaptations, at all levels, that provide a better response for the development of the school curriculum. We saw how the model of SEN implies changing the type of educational response in two aspects:

- The subject is not just the student, but also and mainly the teaching-learning context: the school and the classroom.
- The starting point is not a parallel curriculum, but the ordinary curriculum: stage curricular projects and classroom programming.

Based on the taxonomy chosen in this guide to classify curricular adaptations, and seen in the previous topic the individualized curricular adaptations through the actions of the teacher, we will now address those adaptations corresponding to the physical environment and its organization. For this, we will differentiate between those corresponding to the material changes that need to be made in the classroom and those in the school, both to guarantee the physical integration of students with visual impairment.

7.2.1 CURRICULAR ADAPTATIONS OF THE SCHOOL

These types of adaptations are those that, from the school, respond to the specific needs of students with visual impairment in terms of organizational resources and provision of spatial resources to facilitate learning; but the adaptation measures of the school are not only intended to respond to the educational needs of students with visual problems, they are also beneficial for the rest of the school's students. It is about creating an infrastructure that ensures the internal and external coordination of the school, the effective management of resources, and the real integration of the students, eliminating and adjusting the possible spatial and material barriers.

The objective is for the design of all schools to meet accessibility and inclusivity criteria for all disabilities, with minor adjustments to accessibility when required, although we know the great difficulty that this entails, since it is the responsibility of most public administrations in Europe, not of the educational communities, who can only convey the need. Thus, we will now expose some of the minimum accessibility conditions that would respond to the needs of students with severe visual impairment, based on the recommendations made by the entities of beneficiaries participating in the project, with the aim of illustrating the adaptation process. The most significant adaptations at the school level are:

- Eliminating as many architecture barriers as possible: elimination of barriers to avoid accidents; if this is difficult to comply with, they must be adequately signalized in advance, with clear indications in the message and criteria of maximum visibility (size, location, contrast, etc.). This is something to keep in mind especially in fixed elements like columns, stairs, windows, doors, radiators, fitted wardrobes, doorbells, etc.

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It is convenient to review the routes that the student usually takes to eliminate or try to overcome -if any-, obstacles that may hinder mobility and cause physical danger (low pots, fire extinguishers, benches…). Special attention must be paid to stairs, as it is a point of conflict for visually impaired students. It is convenient to put a sign, such as adhesive tape or tactile bands on the ground preceding the stairs, railings, etc. creating the habit in the school by teachers, students, and staff of verbalizing any situation (hall, classroom, schoolyard, and facilities) so students with low vision can integrate better.

Furniture or objects shouldn't be placed on pathway lines. If they have to be placed in passage areas, it should be done in the gaps in the walls between the beams or columns, and if not possible, avoid placing them in main passage areas. These elements must be placed in such a way that they are easily recognizable by the low vision student.

- Adaptation to lighting: the amount of light needed to visually function properly is also highly variable depending on the visual pathology. In general, increasing lighting improves visual resolution, color perception, depth discrimination and perception, and as a consequence visual functions; however, an increase in lighting does not necessarily lead to better visibility: in the case of students with Albinism or Aniridia, increased lighting can result in greater glare and therefore less visibility and less visual function.

  It is necessary to consider the physical conditions of spaces, avoiding illumination that produce glare and favoring increasing the contrast of spaces that need to be highlighted. The presence of mirrors and shiny floors can also negatively impact visibility due to the large amount of reflections they produce.

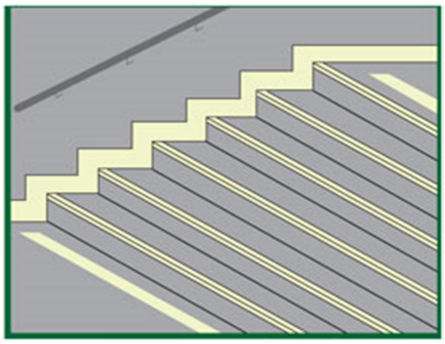
  Some recommendations in this regard that can help in general to ensure optimal visual function, are:

  - Ensure the highest possible contrast.
  - Choose uniform lights and use matt surfaces to avoid glare.
  - Use directional lighting to highlight an obstacle or point out things of interest.
  - Avoid lighting that produces strong shadows.
  - Especially mind lighting in places such as stairs, elevators, emergency exits, corridors.

- Design and signal "accessible routes": plan routes with the necessary access and orientation measures to reach all services of the school, not just the classroom. In many occasions, the accessibility of the gym, conference hall, cafeteria, library, infirmary, specialist teacher rooms, and management -among others-are not taken into account.

  It is convenient to use indicators with textures or objects in the different facilities of the school that provide greater autonomy of orientation. At the same time, Braille indicators can be placed in the different facilities, and also used in notes on the newsboard.

  Likewise, it is also important to enlarge signs for students with low vision and make it easier for them to approach the sign, not putting obstacles under or in front of it.



7.2.2 CURRICULAR ADAPTATIONS OF THE CLASSROOM

As was the case in adaptations for the school, the measures proposed for the classroom are intended to respond to visually impaired students while also being beneficial for the rest. The classroom is the natural space for learning and socialization, so it is where visually impaired students spend more time, and it must therefore meet the same accessibility criteria in its adequacy, design, and inclusion. The spatial distribution, lighting, design, and arrangement of furniture must be planned to promote communication and work, both individually and in teams, allowing for comfortable mobility.

The goal of these adaptations is to ensure that all students participate in the same teaching experiences, and that those with vision or other problems need to leave this space as less as possible. Some actions that facilitate the participation and integration of blind or low vision students in the classroom are:

- Eliminating architecture barriers in the classroom: doors and windows must be completely open or closed; semi-open doors and windows pose a physical threat to the blind student. If possible, cabinets and shelves should be glued to the wall and reach the floor, avoiding protrusions that could be dangerous. They should also not be very high since the items they keep must be easily accessible. Minimal alterations should be made in terms of the distribution of furniture, to not disorient the student. The order in the classroom must be as stable as possible, keeping a stable arrangement of the furniture to facilitate autonomy within the classroom for students with visual impairment. When necessary, students will be warned of the changes and will be able to verify these on the spot.

- Posters or signs, both informative and illustrative, must be placed to be approachable up to 5cm, and at a height that allows them to be read. On the board, a large enough font size will be used to allow students with low vision to read it.

- Noise/sound level: students with low vision use hearing to complement their access to reality, so it plays an even more predominant role in the educational process. They need a relatively calm, non-disruptive sound environment, so it is advisable to control the noise level in classroom in times like during explanations, etc. avoiding outside noises.

- The ideal location for the visually impaired student in the classroom should be based on their needs: near the teacher, the blackboard, the classroom PC, and the window (if they need more light), wherever they can better use their residual vision, and access to their study place must be easy.
  The closeness to the teacher responds to the need to hear the auditory keys that provide the student with information on their environment, essential for their orientation.
  Their place must be spacious, their work table, in addition to being located in the front row, in front of the blackboard, and next to the teacher, has to be large enough to have a PC, tablet, and other materials (optical or technological aids) comfortably and safe. Cables need to be minded so they are not obstacles for the student. Since the need to use technological material doesn't allow them to change places in the classroom, this must not become a reason for isolation by other classmates.

- Regarding the work tables of the students, they must be distributed in the classroom in a way that favors both individual and team work, allowing a high degree of personal concentration and a good communication between classmates. It is necessary to mind the grouping criteria in the classroom so no student is isolated, and to favor their integration.

- Teachers should not stand with their back to the light, especially when explaining, since visually impaired students can be dazed. When explaining while writing on the board, position yourself so you do not cover what is being written (making the student lose information).

- General ergonomics: students with low vision, tend to get very close to the text they are reading or writing. In order to avoid back problems, it is advisable to use ergonomic elements in the study position, like a lectern, a table with various degrees of inclination, a cold table light, etc…

- The materials in the classroom to support learning, especially involving reading, must be accessible (see Annex 2 of DU6 for more information), that is, of sufficient size for the visually impaired student to access it. If this is not feasible or available, the teacher should have software that digitizes non-accessible texts, allowing them to be read on the PC screen and heard with a voice synthesizer.

We do not define specific facilities like the gym, the computer science room, etc. because they must meet the same criteria as any ordinary classroom. The fact that we do not focus on them is not because they are less important, on the contrary: in many occasions, due to the short time spent there, due attention is not paid from the school, and they remain without the needed access measures for these students.

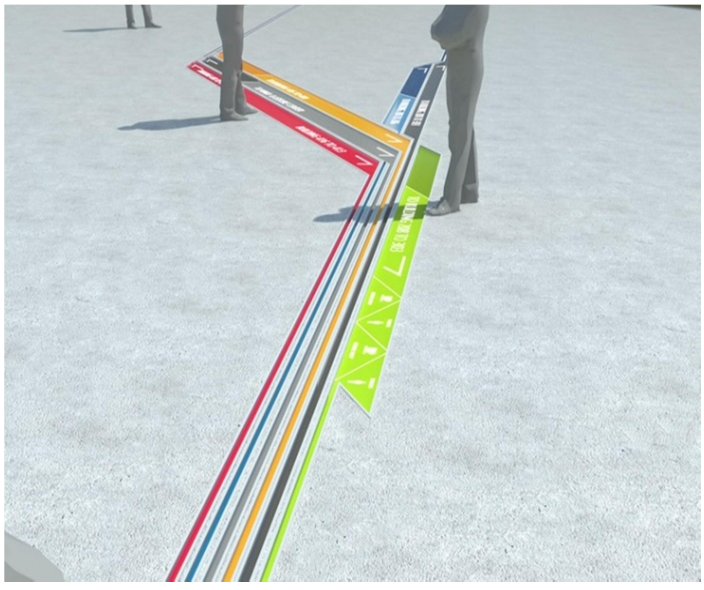
7.2.3 GENERAL GUIDANCE FOR OTHER ADAPTATIONS

The dining room, in addition to being a space where a basic need is met, is an educational and relationship space where students acquire eating habits, postures, develop fine motor skills, relate to equals, etc. so accessibility criteria must also be considered in its design and planning, to also make them inclusive areas: the size and shape of tables and chairs, their location, the correct marking of items (cutlery, plates, napkins, trays, garbage can, etc.) help favor the personal autonomy of students with visual impairment, their acquisition of habits, behavioral self-control, and indirectly also develop a perception of autonomy that will lead to positive self-esteem.

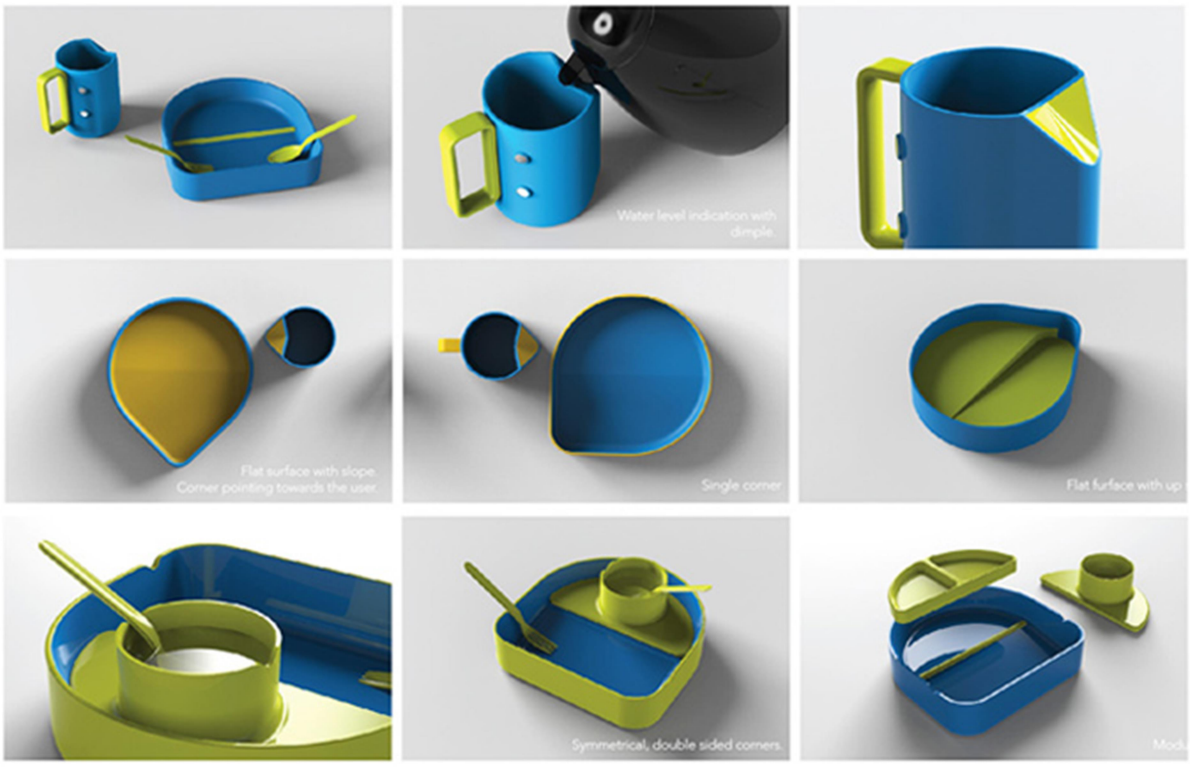
One aspect that is not usually considered is the contrast between tableware and cutlery, especially in the storage area, and the non-marking of some condiments, so we recommend for the maximum contrast by using tablecloths both for the storage area and tables. Contrast is not achieved with cutlery of different colors, since this could cause the opposite effect, but is easily achievable with colored tablecloths (smooth if possible) contrasted with the kitchenware.

We propose the need for auxiliary cafeteria staff to act as support for students with SSNN -in our case derived from visual impairment- with the objective of providing a guided modeling and supervision. In students from 5 to 7 years old, the guidance and modeling function will be more needed, progressively turning into just supervision.

The conference hall of the school must also meet the school's accessibility and design measures: as an accessibility adjustment for students with visual disabilities, the school will have audiovisual technology that allows them to see what happens on stage (shows, films, exhibitions, etc.) via a screen. Technical means will be placed in the first row in an accessible and more inclusive way: students will be behind the screen, always accompanied by their classmates, since sometimes when promoting accessibility to students with visual disabilities, one does not consider social inclusion, and the measures taken -although successfully increasing accessibility- can mean separation from their classmates.



In the schoolyard, we must be mindful of the need for more time to adapt to changes in light, especially when the student comes back to the classroom. There is also a need for filters that reduce light (sunglasses) in outdoor spaces; children must be taught to be responsible for looking for them in their backpack and using them, keeping those not used always in the same place. They should also use a cap as a protection, and in the case of Albinism, sun cream on days of intense sunlight.



7.3 COLLABORATION OF THE SCHOOL WITH ASSOCIATIONS OF BENEFICIARIES

The model of educational intervention that is generally carried out in the EU member countries for students with severe visual impairment and which enables their academic and social inclusion is based on the so-called educational inclusion. In order to achieve greater normalization and inclusion of students in the family, social, and educational environment, collaboration between the associations of beneficiaries and the educational center is essential.

The entities of the associative movement -in this case persons with visual impairment- play a key role to achieve true inclusive education, through actions/ interventions like:

- **Welcoming and guidance to the family**, if needed.
- **Encouraging the participation of families in school life**, promoting that schools boost and develop channels of collaboration and measures that facilitate the information, orientation, and communication necessary for families to intervene in the decision-making that affects the schooling and educational processes of their children with SSNN.
- **Informational and training activities in schools** aimed at all sectors of the educational community to raise the awareness of the agents involved and of society as a whole, and facilitate their involvement in the social and educational inclusion of these students.
- **Promoting schooling in pre-primary education**. It is necessary to promote the early evaluation and detection and apply measures to achieve the full schooling of students with SSNN aged between 3 and 6 years to compensate for inequalities and gradually increase educational attention to the child population from 0 to 3 years, with the adequate and necessary support resources and professionals for their care.
- **Diagnostic assessment of the student's abilities and difficulties**.
- **Promoting school success in all educational stages** by developing organizational and resource management strategies and the implementation of universal accessibility measures aimed at educational inclusion and improving school success, and incorporating them into the actions of educational center programs for increased school success.
- **Facilitate universal accessibility** (to teaching centers and campuses, to communication and information, to teaching resources and materials, technical aids and ICT, adapted school transport…) so students with low vision can fully participate in equal opportunities in the teaching-learning process in any area of the educational system.
- **Orientation to the school about the intervention program**.
- **Encouraging schools to create and develop educational projects** with measures to achieve access, permanence, promotion, and educational success of students with visual impairment, facilitating the participation and training of families and the collaboration of other entities.
- **Intervention of specialized professionals** that make up Specific Teams (psychologists, teachers, therapists, social workers, rehabilitation technicians…).
- **Promoting the development of plans and structures** for internal support and advice in the centers. The aim is to encourage educational centers, by exercising their autonomy, to draw up plans that include comprehensive attention to the diversity of these students, and to promote coordination between administrations, institutions, and associations with the educational center and their interaction with the environment.
- **Specialized advice on the needs of minors** -if they are- **and their family**.

- **Promote schooling of students with SSNN in ordinary schools** derived from low vision and its flexibility, so they can access an educational modality adjusted to their needs, leaving schooling in specialized centers as the last option once all others are exhausted.
- **Coordination with other centers, schools, and early care services**.
- **Reinforcing the initial and permanent training** of the teachers and professionals involved, enabling them to offer inclusive and quality educational attention to students with SSNN.
- **Training of management teams** and education inspection to promote the improvement of educational inclusion and the full participation and collaboration of all professionals and components of the educational community.
- **Information on existing resources**.
- **Educational guidance services** to enhance the detection and care of students with SSNN due to visual deficit and early detection in the period 0-3, optimizing the resources of educational guidance services and enabling psycho-pedagogical evaluation and guidance to teachers and care for families.

Likewise, in another of the lines of action of the beneficiary entities that also influences the education of students with visual impairment, we find actions aimed at other stakeholders:

- **Disseminating inclusive education actions and good practices** through the Ministry of Education of each country, the school councils of the states, the European Agency for the development of students with SSNN, etc.
- **Carrying out specific studies** to promote research and educational innovation on different aspects related to the care of students with low vision, such as the necessary measures for the early detection of SSNN and the support resources that favor educational inclusion and promotion within the system education, the keys to success in secondary education, the adequacy of adult education, the transition to employment and vocational training, and the application of the United Nations Convention, which serve as a basis for the development of plans of intervention.
- **Coordination between administrations for early care** in the development of early detection protocols in children between 0 and 6 years of age that may have visual impairment, and in emerging cases throughout the school stage, at the same time as global action protocols are established to act as comprehensive care teams for childhood and throughout the school stage.
- **Coordination between administrations, institutions, and the entities** themselves to develop comprehensive care programs aimed at students with SSNN -in this case derived from low vision- both in the school period and in lifelong learning and insertion labor.

7.4 ACTIVITIES

ACTIVITY 1 - Check what you have learned. Reflect on the following statements and find out the correct answer:

1. The Warnok report (1978) was essential for the European educational systems to put into practice years later the concept of:
   a) Integration.
   b) Inclusive education.
   c) Special education.
   d) None of the above is correct.

2. The context on which educational guidelines, strategies, and actions that allow intervening on the reality we are dealing with are structured is:
   a) Curricular adaptation of the school.
   b) Plan for Attention to Diversity (PAD).
   c) Curricular adaptations of the classroom.
   d) Both a) and c) are correct.

3. The Plan for Attention to Diversity (PAD) has to be reviewed?
   a) Only once in each school.
   b) At the end of each school year.
   c) Its development entails a constant revision throughout the school year.
   d) Only at the beginning of the school year.

4. The school's curricular adaptations are those that answer to the specific needs of students with visual impairment regarding:
   a) Organizational and special resources.
   b) Personal resources.
   c) Resources of access to the proper curriculum.
   d) All of the above.

5. Which of the following adaptations is not considered a school curricular adaptation?
   a) Adaptation of the study place.
   b) Creation of accessible itineraries.
   c) Adaptation of lighting.
   d) Elimination of architectural barriers.

6. Is controlling the noise level in the classroom a curricular adaptation of the school?
   a) Yes.
   b) No. It is an adaptation of the classroom.
   c) Noise control isn't a kind of intervention contemplated within the adaptations.
   d) Only if the student has a residual vision.

7. Regarding the best placement of students with visual impairment in the classroom:
   a) It must be the same as their peers'.
   b) It is only necessary to consider certain ergonomics aspects.
   c) They should always be near the teacher so they can appreciate the hearing keys that provide them information on their environment, even if it means some isolation.
   d) They will be placed matching their needs: near the teacher, near the board, near the window if they need more light; wherever they better use their residual vision.

ACTIVITY 2 - If a 3-year-old student with Aniridia or Albinism (with a residual vision of 20%) starts the second cycle of pre-primary education within the Plan for Attention to Diversity (PAD), what classroom and school adaptations would they need?

Consider the identification of the needs of the student previously defined in the initial evaluation made in Activity 2 of DU6.

Send us your proposals for curricular adaptations of the school and the classroom via the e-Learning platform, and our experts will evaluate, correct, and help you.

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Looking out for a School for All

COURSE FOR
PRE-PRIMARY SCHOOL
TEACHERS

DIDACTIC UNIT 8

RESOURCES FOR TEACHERS

Looking out for a School for All

This is the educational material uploaded to VIRTUAL INCLUSIVE EDUCATION and developed by REDTREE MAKING PROJECTS in collaboration with SMALLCODES SRL, ASOCIACIÓN ALBA, ANIRIDIA EUROPE, ANIRIDIA NORGE, and ANIRIDIA ITALIANA within the project “LOOKING OUT FOR A SCHOOL FOR ALL: EARLY EDUCATIONAL INCLUSION FOR STUDENTS WITH LOW VISION”, co-funded by the ERASMUS PLUS PROGRAMME OF THE EUROPEAN UNION.

Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission.
This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the
Erasmus+ Programme
of the European Union

COURSE FOR PRE-PRIMARY SCHOOL TEACHERS

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"Every child deserves a champion, an adult who never gives up on them, who understands the power of connection, and insists that they can become the best that they can be."

- Rita Pierson

OBJECTIVES OF THE DIDACTIC UNIT

At the end of this didactic unit, you will:

- Become familiar with the various models of curricular adaptation, as well as reflect on what their use means.
- Identify all the steps that must be taken to carry out an adaptation model through a practical case.
- Understand the importance of visual stimulation to improve the sense of achievement and learning.
- Know the different types of educational resources that students with low vision will be able to count on.
- Know the particularities of the methodology used in each of the visual stimulation programs, their advantages and limitations.
- To be introduced to the techniques of educational intervention through the guidelines and orientations that visual stimulation activities should contemplate.
- Become aware of the existing specific electronic resources that can serve as a complementary resource for the teacher in the classroom when working on visual stimulation programs with children with low vision in 2nd cycle of pre-primary education.

INTRODUCTION

Considering the indicator generalized by the European Agency for Development in Special Needs Education, and commonly used in the European Union, which shows the inclusion rate of these students in ordinary school, the three countries participating in the project (Italy, Norway and Spain) are among those that meet the conditions[1], meaning that they have a decided commitment to inclusive school. Even knowing that this is just a quantitative indicator that neither fully ensures a high quality inclusion, nor includes other types of positive experiences, it does indicate significant data in favor of inclusion. We

[1] López-Torrijo, Manuel (2009). La inclusión educativa de los alumnos con discapacidades graves y permanentes en la Unión Europea. *RELIEVE*, *v. 15*, n. 1. http://www.uv.es/RELIEVE/v15n1/RELIEVEv15n1_5.htm.

also know that more and more schools have the possibility of adapting national curricula to the needs and characteristics of their students, to guarantee an inclusive school quality. This is how school projects emerge, later materializing into classroom projects, and lastly into individualized projects. The different types and characteristics of these individualized adaptations were already developed in topic 6 of this course, so here we will present models and references as resources for the teacher.

The following are a series of educational resources for the field of visual stimulation, as an element of great importance when structuring curricular adaptations and early interventions in children with visual impairment in pre-primary education. Visual stimulation itself is a specific technique that requires the creation of an individualized program of activities and exercises that follows a sequence of visual experiences aimed at seeking an improvement in visual functioning, after the pertinent assessment of the visual behavior of the person who, hypothetically, it is susceptible to education or visual re-education.

From the physical-material environment to the digital context, we bring some considerations, recommendations, and proposals for activities and applications that can be carried out in the 2nd cycle of pre-primary education stage, both in the family and school environments, always following the advice of professionals specialized in the education of persons with low vision.

8.1 MODELS OF CURRICULAR ADAPTATION

In the case of the three European countries that collaborate in this course, there are specific curricular designs for attention to diversity, both inside and outside the classroom. Specifically, some –like Italy– have expressed this in legal terms, changing their educational approach to offer more answers within ordinary education. Of course, the perspectives of all the participating European countries are closely related to the current European position of inclusive education, as we have highlighted throughout the course. All these countries defend that the general curriculum framework should cover all students, so that, of course, some specific adaptations are necessary, including specific resources within the mainstream school, which will be structured through an individualized intervention plan that includes an adaptation of access to both the classroom and the school, or a curricular adaptation.

As we pointed out, the use of curricular adaptations is one of the current trends in Europe: using this individual document to specify the specific needs of the students, their objectives, methodology and means, to detail the degree and type of adaptations to be made in the ordinary curriculum, and to evaluate the progress of the students. Likewise, it can also serve as a "contact" between the different "actors": families, teachers and other professionals.

According to the country descriptions, it is clear that in almost all of them, individualized curricular adaptations (ICAs) play an important role in addressing special needs in the most inclusive ways.

8.1.1 MODELS OF REFERENCE

After a bibliographic review carried out by the partner entities, we have found diverse publications with models that collect different types of adaptations made for students, sometimes with different characteristics from those we address in this course, but all of them, despite having a different format, share their sections.

Below are links to consult those we have found most interesting:

- Generic model for individualized curricular adaptations for pre-primary education: https://es.slideshare.net/patriganzo/acitdah-en-infantil
- Generic model for individualized curricular adaptations for primary education: https://www.slideshare.net/rosamariamartinezmartinez395/modelo-aci-34681764
- Generic model for individualized curricular adaptations for secondary education: https://es.slideshare.net/bgonzalezvivas/aci-48571456
- Generic model for non-significant curricular adaptation or adaptation to the curriculum: https://en.calameo.com/read/001346807ba304e51e98a
- Generic model for individualized work plan: https://es.slideshare.net/SuperPete/106838-modelo-plandetrabajoindividualizada

8.1.2 PRACTICAL CASE

The model we propose below is the result of research in European educational laws and models that the project's partner entities have considered more relevant, through the experience of different education professionals, and the experience of students with Albinism and Aniridia.

This proposal is based on the work developed by ALBA (association to help persons with albinism) in the project "*Together we can overcome barriers: a strategy for equity*", and we have taken it as an example of what an adaptation for students with albinism or aniridia in pre-primary education should be, or at least than what it should collect, but in no case can it be taken as a single model.

In this document, one can choose the strategies and measures that best suit the student in question, in the case of albinism or aniridia, in our school. It is also open and flexible, due to the need for frequent and continuous review.

Lastly, we want to remind that the initial process of chosing measures will be based on the initial tests and previous records and information.

8.2 EDUCATIONAL RESOURCES

Vision cannot be saved or spent, but the more it is used, the more it is likely to work better. Thus, the younger the child, the greater the likelihood of progress in the use of vision; so as we saw in topic 3, visual learning advances parallel to the child's cognitive development.

Children with low vision need to be encouraged to use it in all tasks and activities, even if there is no certainty that they can actually see objects or pictures. Low hopes always lead to an absence of progress. This is why there are many educational resources to teach children with low vision to work while keeping eye contact with objects and especially with people.

8.2.1 VISUAL STIMULATION PROGRAMS

The programs working in the area of visual stimulation usually pursue the optimization of the functionality of residual vision, using the techniques and skills acquired to get information and interpret the environment to achieve autonomy and efficiency in the different areas of daily life.

By visual stimulation we understand an ordered series of visual experiences, matching the age and maturity of the child, aimed at bringing their visual development closer to what is considered normal. Thus, the main purpose of visual stimulation is "learning to see", or for the person to use their residual vision in any environmental condition.

For this, the application of programs aimed at promoting visual efficiency is essential. These programs are supported by the fact that the capability for visual functioning is neither innate nor automatic, nor is it related to the type and degree of loss, but rather that "the more you look, the more the sensory pathways that reach the brain are stimulated; so the more vision is used, the more a better visual functioning is facilitated" (Barraga 1983).

In this way, and based on the results obtained in the different tests for the evaluation of the functionality of the residual vision, individualized stimulation programs are developed with the objective of acquiring visual skills, from the most basic ones such as location, focusing, or monitoring of lights and objects, even the most refined ones like visual-motor coordination, interpretation of spatial relationships, or visual associations.

When organizing this type of program, it is first necessary to consider visual stimulation as another aspect of development, and our intervention will take into account that the child will function visually more effectively and better the more competent they are in the rest of the areas. We will also always consider their family and your environment, as they are key to their emotional and affective development, as we have been repeating throughout the course.

There is a range of programs and materials in the area of visual stimulation, aimed at different age ranges and with a series of strengths and weaknesses depending on the age of intervention, content, etc. Based on the analysis carried out by García Bohórquez, M.T and Vélez Mendoza, M.A. in their

doctoral thesis[2], we have chosen those programs most used for the age range of 3 to 6 years for this occasion, and also because they are the subject of attention to which we are addressing in this course.

Next, we will briefly showcase the visual stimulation programs and scales: the objective is to analyze the techniques, faculties, or areas that each scale develops, to understand the aspects related to visual functioning. Therefore, for a better understanding of each program, we advise to review the bibliography.

- **Program to Develop Efficiency in Visual Functioning (PDEFV):** (1995) it is a program to develop efficiency in visual functioning, aimed at ages of visual development from 1 month to 7 years. Its author (Natalie Barraga) assures that visual functioning can be improved with training.

  To do this, it is based on the sequence of normal visual development. According to Barraga, visual functioning in childhood evolves spontaneously and improves through systematic training, thanks to the use of their vision, since the development of sight is not innate or automatic. In visually impaired children this development is altered, so it is necessary to help them in this learning, which does not occur spontaneously.

  Dr. Barraga's program consists of:
  - Visual behavior observation protocol.
  - Diagnostic assessment with 40 exercises representing the categories of visual development, from which results are obtained on the mastery of visual tasks in each category and those in which teaching is needed are planned.
  - Teaching procedures with 150 lessons linked to sequenced visual tasks, grouped into the categories of visual development that are to be boosted.

- **Frosting: visual perception.** This program for the development of visual perception (Marianne Frostig, David Horne, and Ann Marie Miller) considers that visual perception is not just the ability to see correctly, but to recognize and discriminate visual stimuli and interpret them, associating them with previous experiences. Training visual perception is effective when it is included in a comprehensive plan for the development of the child. This program is intended for children with visual perception problems between 3 and 7 years old.

  This program consists of:
  - Visual perception development test, designed to detect disorders in each of the 5 faculties studied.
  - Preparatory program in which the child is taught various concepts with three-dimensional materials: images, concepts, body structure, association of body movements with line drawing, recognizing figures, laterality exercises, eye movements, eye-hand coordination…

[2] García Bohórquez, M.T and Vélez Mendoza, M.A (2012): Design and implementation of an interdisciplinary stimulation program to provide functional independence, aimed at children with low vision from 0 to 6 years old. Politechnic University of Guayaquil, Ecuador.

- Figures and forms, is the program for the development of visual perception, using two-dimensional sheets. They are distributed in three booklets corresponding to the same levels of difficulty (initial, intermediate, and advanced).

- **IVEY Project:** This program (Increasing Visual Efficiency, by Audrey J. Smith and Karen Shane Cote) was developed by the public schools of Florida (USA), to increase visual efficiency from birth. The goal is to develop a program to stimulate vision and training in the use of low vision aids to improve functioning.
  The activities are well structured, sequenced, and organized according to visual development. The objectives, materials, procedure, comments, suggestions, and a section for adaptations for students with deficiencies are presented in all the lessons, where very precise and useful guidelines are given. It also includes a large number of activities for children with severe low vision. This visual stimulation program also presents a training program for families and teachers.

- **Light Box:** (Suzette Frere) this is a method conceived and developed by the *American Printing House for the Blind* on the initiative of teachers and professionals familiarized with the needs of children with reduced vision. It is a guide of materials and activities to teach the most basic and the most complex visual skills (visual-motor and visual-perceptual). The materials it contains are very varied and appealing, with appropriate designs in sizes, shapes, and colors.

  It consists of three maturity levels, with an array of materials per level and the light box:
  - First level (children with visual ages from 0 to 3 years old): works on awareness, location and monitoring of visual stimuli, hand-eye coordination and initiation to the ability to match and discriminate with specific materials (light awareness, light location and tracking, hand-eye coordination, object permanence, color and size differentiation, visual memory, etc.).
  - Second level (children with visual ages from 3 to 5 years old): works on more complex visual perception functions, using real materials with pictorial representation (eye-hand coordination, spatial relationships, and visual, serial and modeling memory.).
  - Third level (children with visual ages from 4 to 6 years old with a certain level of knowledge and understanding, requiring the capability to transfer what they have learned into abstract concepts): it works on drawings, silhouettes, symbols, letters, and words (matching and classifying shapes and colors, recognition and identification, spatial relationships, visual memory, figure-background differentiation, visual closure, etc.).

- **The Leonhardt Kit:** this visual stimulation kit "The Vision", by Mercè Leonhardt, is a visual stimulation battery that consists of a series of materials designed through many years of experience, used with children with low vision or brain visual deficit, starting from birth.
  Likewise, it wants to provide possibilities of knowledge in terms of autonomy, and possibilities of visual development for children with low vision.

- **Teach me to look:** this array of materials are a set of visual stimulation materials devised by professionals of the Early Care Team of the Educational Resource School of ONCE in Barcelona, which intervenes throughout the region of Catalonia, enhancing the acquisition of the first visual

Co-funded by the Erasmus+ Programme of the European Union

functions of children from 0 to 3 years old (with visual impairment or risk of suffering it, with or without other associated disorders).
The content of this pack consist of a series of basic materials that deal with the integral sensory approach, and a guide to start visual stimulation in these children.

In addition those mentioned above, we have other more innovative programs and resources specifically designed to develop basic visual functions using a PC:

- **Digital Visual Training Program (EVO):** it consists of four training modules and one of recap games. The first module, basic stimulation, works on the optical and optic-perceptual functions (visual awareness, focus, gaze changes, locating, path monitoring, etc.). The remaining modules work on the optic-perceptual and perceptual functions (internal and external similarities, internal and external differences, critical features, facial expressions, puzzles, symmetry…). This program allows to adapt various stimulating parameters such as size, speed, colors, shapes… and to be monitored by the professional.

- **EFIVIS:** this program is designed for young children, and contains 15 activities and 4 games covering a wide number of visual tasks. These are designed to stimulate the visual and perceptual efficiency of children with low vision. All visual tasks related to the perceptual functions of vision are worked on (attention, monitoring, eye-hand coordination, etc.).

- **The SENSWITCHER program:** designed by "Inclusive Ecnology", a leading company in the development of software for special needs, it has been made with the latest Macromedia Flash technology. This stimulation program for multi-disabled children consists of 132 animated activities that can be worked on with different types of devices. The program is free, you can use it directly from the internet, on the page:

  - http://www.northerngrid.org/sen/NetSwitch/index.htm

8.2.2 VISUAL STIMULATION ACTIVITIES

Although the techniques and tasks included in the visual stimulation programs should be in the hands of professionals specialized in the prior assessment and in the procedures for applying them, from the school or the family, it can and should be supported, in coordination with specialists, to promote the continued use of vision.

Therefore, we bring some considerations or recommendations that should contemplate the proposals of activities to be carried out in the childhood stage in the family and school environments, always following the advice of professionals specialized in educational intervention with persons with low vision.

- ACTIVITIES TO TEACH EYE MOVEMENT:

- Moving from left to right.

- Increasing peripheral vision.
- Focusing with moving head.
- Following regular movements.
- Following irregular movements.

- ACTIVITIES TO ENHANCE VISOMOTOR COORDINATION:

- Cutting.
- Free gluing.
- Locating and gluing.
- Tracing with the fingers.
- Threading beads.
- Tracing and coloring.
- Autonomy skills:
    - Buttoning / unbuttoning.
    - Tying / untying shoelaces.
    - Using simple tools.
    - Carrying objects.
    - Pouring liquids in containers.
- Games:
    - Touch and hit.
    - Throw and receive.
    - Running.
- Jumping/ impulse/ succession of jumps.

- ACTIVITIES TO ENHANCE THE FIGURE-BACKGROUND PERCEPTION:

- Sepparation of objects by categories.
- Selection of objects - identification of qualities.
- Eye scanning narrations:
    - Outdoors.
    - Indoors.
    - In sheets.

- ACTIVITIES TO ENHANCE PERCEPTUAL CONSTANCE:

- Handling items and materials.
- Free constructions.
- Recognition of three-dimensional objects in sheets.
- Comparing and differencing more complex forms.
- Classificating (search and selection) by size-shape-color.

- ACTIVITIES TO ENHANCE THE PERCEPTION OF THE POSITIONS OF BODIES IN SPACE:

- Body-object relationship exercises.
- Directionality:
    - Left-right differentiation of oneself.

- Left-right differentiation of positions of objects regarding oneself.

- Reversal and rotation.

- ACTIVITIES TO ENHANCE THE PERCEPTION OF THE RELATIONSHIPS BETWEEN OBJECTS IN SPACE:

- Model building.
- Differentiation of positions in models.
- Building with objects in sheets.
- Symmetry.

- ACTIVITIES TO SUPPORT VISUAL MEMORY

- Memory for isolated figures.
- Memory for complex models.
- Memory for visual sequences.
- Memoty for series of actions.

- ACTIVITIES TO ENCOURAGE VISUALIZATION, IMAGINATION AND MENTAL ELABORATION:

- Composition of structures with geometric shapes with/without model.
- Reversal of the order.
- Change of position of a figure.
- Symmetrical constructions.
- Memory repetitions.

8.2.3 SPECIFIC ELECTRONIC RESOURCES

We have already emphasized that we can enhance the visual attention and perception capabilities of the children through visual stimuli, and that we also give them the necessary tools to learn to see and discover the world on their own. But this visual stimulation with diverse adapted materials is not only possible through physical (tangible) resources, this need shown by children with low vision -produced by their condition of albinism or aniridia- can also be addressed by electronic and digital resources.

Beyond the visual stimulation programs seen in section 8.2.1 of this topic, which use the PC for their application, we can find multiple specific APPs for smartphones and tablet devices, aimed at low vision in general, and designed specifically to work with children in 2nd cycle of pre-primary education.

Through ONCE's ACCEDO - Educational Attention Department, and in collaboration with the Directorate of Education, Employment, and Cultural Promotion of the Ministry of Education, Culture, and Sports of the Government of Spain, we have been able to access a catalog of APPs for visually handicapped students in inclusive schools. These are analyzed based on the skills they develop and their level of accessibility/usability.

Below we show some of them, specific to the educational stage that concerns us in this guide (second cycle of pre-primary education 3 to 6 years old):

- 3D PUZZLE BLOCKS
  - BASIC COMPETENCES: competence in linguistic communication.
  - BASIC SPECIFIC COMPETENCES: visual stimulation: discrimination of images, visual-motor coordination.

- ABC 123 READING AND WRITING NEOFINGER
  - BASIC COMPETENCES: competence in linguistic communication, competence of learning to learn.
  - BASIC SPECIFIC COMPETENCES: auditory discrimination, visual discrimination of letters and numbers, eye-hand coordination.

- ABC PREESCHOL PLAYGROUND
  - BASIC COMPETENCES: competence in linguistic communication, competence of learning to learn.
  - BASIC SPECIFIC COMPETENCES: eye-hand coordination, color recognition.

- ACCESSIBLE MEMORY PRO
  - BASIC COMPETENCES: mathematical competence, competence of learning to learn.
  - SPECIFIC BASIC COMPETENCES: visual and auditory memory, tactile skills, using TalkBack.

- ALEX LEARNS TO DRESS ON HIS OWN
  - BASIC COMPETENCES: competence in linguistic communication, competence of learning to learn, autonomy and personal initiative.
  - BASIC SPECIFIC COMPETENCES: it can work very well on the perception of body parts and clothing, spatial perception, and colors.

- LEARN TO TELL TIME
  - BASIC COMPETENCES: competence in linguistic communication, mathematical competence, competence of learning to learn, autonomy and personal initiative.
  - BASIC SPECIFIC COMPETENCES: visual stimulation: visual-motor coordination, discrimination of analog and digital clocks, spatial perception.

- LEARN THE COLORS
  - BASIC COMPETENCES: competence in knowledge and interaction with the physical world, competence of learning to learn, competence in linguistic communication.
  - BASIC SPECIFIC COMPETENCES: visual discrimination of colors, objects, fruits, and animals.

- BABY PLAY FACE
  - BASIC COMPETENCES: competence in linguistic communication, competence in knowledge and interaction with the physical world, competence of learning to learn.
  - BASIC SPECIFIC COMPETENCES: a very simple application to work on visual discrimination of the parts of the face and body.

- BLINDSIMONE
  - BASIC COMPETENCES: competence of learning to learn.
  - BASIC SPECIFIC COMPETENCES: spatial orientation, color, auditive discrimination, memory.

- BUILD IT UP
  - BASIC COMPETENCES: competence in knowledge and interaction with the physical world, competence of learning to learn, autonomy and personal initiative, mathematical competence, competence in linguistic communication.
  - BASIC SPECIFIC COMPETENCES: digital scanning, eye-hand coordination, spatial perception, visomotor coordination, discrimination of colors and sizes.

- CALLIGRAPHY DSW DEV
  - BASIC COMPETENCES: competence of learning to learn.
  - BASIC SPECIFIC COMPETENCES: visual-motor coordination.

- DOCTOR PANDA AIRPORT
  - BASIC COMPETENCES: mathematical competence, autonomy and personal initiative, competence in knowledge and interaction with the physical world, social and civic competence.
  - BASIC SPECIFIC COMPETENCES: visual discrimination, visual-motor coordination, figure-background discrimination.

- THE GAME OF OPPOSITES
  - BASIC COMPETENCES: competence in linguistic communication, competence of learning to learn.
  - BASIC SPECIFIC COMPETENCES: recognizing opposite concepts with visual discrimination and developing visual memory.

- FLOWFREE
  - BASIC COMPETENCES: information processing and digital competence, competence of learning to learn, mathematical competence.
  - BASIC SPECIFIC COMPETENCES: visual stimulation, tactile skills, tracking, location, visual-motor coordination, visual and chromatic discrimination, focusing, figure-background, spatial orientation.

- GAME KIDDS FREE
  - BASIC COMPETENCES: information processing and digital competence, competence of learning to learn, autonomy and personal initiative.
  - BASIC SPECIFIC COMPETENCES: hand-eye coordination, tracking, discrimination, sound recognition.

- BAND GAME
  - BASIC COMPETENCES: information processing and digital competence, cultural and artistic competence, autonomy and personal initiative.

- SPECIFIC BASIC SKILLS: hand-eye coordination, improvisation.

- KIDS SOCKS
  - BASIC COMPETENCES: competence in knowledge and interaction with the physical world, mathematical competence.
  - BASIC SPECIFIC COMPETENCES: hand-eye coordination, tracking and location, visual discrimination, visual memory.

- MATCH IT UP 2 / MATCH IT UP 3
  - BASIC COMPETENCES: competence in knowledge and interaction with the physical world, competence of learning to learn, autonomy and personal initiative, competence in linguistic communication.
  - BASIC SPECIFIC COMPETENCES: attention, exploration, discrimination, location, and visual motor coordination, designation and recognition of drawings, image recognition, tracking and location, attention, exploration, discrimination, and visual motor coordination.

- SOUND TOUCH
  - BASIC SKILLS: competence in linguistic communication, competence in knowledge and interaction with the physical world, information processing and digital competence, cultural and artistic competence, competence of learning to learn, autonomy and personal initiative.
  - BASIC SPECIFIC COMPETENCES: the visual discrimination of 192 images with sounds of animals, vehicles, musical instruments, and household objects, perfect for working on visual attention.

Despite the great variety of digital resources offered in this regard, very few of the APPs shown for children in pre-primary education age have a comprehensive educational approach, that is, the vast majority focus on working one specific area or skills. Based on this analysis and bearing in mind the importance of early stimulation from a comprehensive approach in the learning process, we cannot finish this section without naming two APPs:

- **TouchVIC -App**

Touch-system for Visual Impaired Children (Touch-VIC) is designed to be used in addition to the activities carried out in early stimulation programs for children with visual disabilities. It integrates 9 different types of activities aimed at stimulating cognitive, emotional, sensory, and motor aspects; as well as a tool that allows to customize the exercises to adapt them to the interests, needs, and abilities of the children at all times. It also has options that allow the creation of personalized timetables to plan the sequencing of activities and evaluation sessions.

- **ViSApp – Visual Stimulation Application**

The VISApp educational game is an ICT tool for the inclusion of students with visual impairment in the classroom, which provides solutions and answers to teachers to facilitate the effective inclusion of these children in ordinary classrooms. This tool, designed under the framework of the **School For All** Erasmus Plus project, is conceived as a mechanism for inclusion in equity, so it is not devised for the exclusive use

of students with SEN, but as a resource to be shared by all students and the teacher. This not only contributes to creating a development of the user's sensory perception and the stimulation of their creativity, but also promotes group work and socialization among all students, by encouraging collaborative work on an equal footing, regardless of their barriers.

VISApp improves and stimulates cognitive development, promotes visual and auditory stimulation, and teaches cause-effect relationships through a game for the Android and IOS environment, playable via devices such as tablets or screens. It is structured on two itineraries: 1- first cycle of pre-primary education (0-3 years old); 2- second cycle of pre-primary education (3-6 years old); each of them is comprised of a set of 6 games with different levels of complexity, from passive reception to active participation via interaction with the device.

This APP incorporates options that allow the teacher/tutor to adjust contrast, color, sound, or configure the shapes and objects that appear in the games. It is coupled by a methodological and use guide for proper operation.

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PDF – PROPOSAL OF A MODEL OF PRE-PRIMARY EDUCATION CURRICULAR ADAPTATION

SCHOOL – (provide the name and logo of the school)

Adaptation measure:

	NON-SIGNIFICATIVE CURRICULAR ADAPTATION
	ADAPTATION OF ACCESS TO THE CURRICULUM

Student: .....
School year: ..... Level: .....
Teacher/Tutor: .....
Head of Educational Orientation: .....
Foreseen furation: .....

GENERAL INFORMATION

Name of the student: .....
Birth date: ..... Age: .....
Name of the parents/ legal tutor: .....
Address: .....
City/ town: .....

Phone nº: .....
e-mail address: .....
Observations:

* Student with Albinism OCA type ___, with difficulties in accessing the curriculum, derived from his/her condition.

* Student with Aniridia with difficulties in accessing the curriculum, derived from his/her condition.

INITIAL DATA

1. HEALTH ISSUES OR DIFFICULTIES:

Albinism

- Type of Albinism: .....
- Nistagmus: .....
- Photophobia: .....
- Visual field: .....
- Visual accuity: .....
- Others: .....

Aniridia

- Nistagmus: .....
- Glaucoma: .....
- Cataracts: .....
- Cheratopathy: .....
- Photophobia: .....
- Visual field: .....
- Visual accuity: .....
- Others: .....
- Difficulties derived from their condition:
  - Low vision.
  - Absence of peripheral vision.
  - Difficulty in differentiating objects and sources with absence of contrast.
  - Reduced visual field.

2. SCHOOL PROBLEMS:

Teachers:

- Difficulty in physically distinguishing between teachers and the spaces in which the activities are carried out.
- Need for educational support and monitoring.

- Coordinating figure (tutor) who controls and informs the rest of the teaching staff.
- Previous choice of the student's classroom, so it meets the necessary requirements for a good incorporation.

Classmates:

- Difficulty in physically distinguishing between classmates.
- Need to have classmates of reference and support when carrying out some activities.

Difficulties derived from their condition:

- Difficulty when locating classrooms, if they change.
- In group activities, difficulties to distinguish between them, which can cause problems in some activities.
- Trouble following explanations if they require graphic support.
- Impossibility of using the same book/copy format… as their classmates.
- Difficulty in seeing the board and following explanations.

3. FAMILY/SOCIAL DIFFICULTIES:

Family:

Social:

- Social rejection may appear due to:
  - Physical appearance.
  - Extraordinary attention from the teachers.
  - The amount of technical resources needed on a daily basis.
  - Interacting less or not recognizing classmates at times.
- Need to use resources that the family or the School cannot provide.

4. PSYCHOPEDAGOGICAL ASPECTS:

Level of curricular proficiency:

Learning style:

Behavior in the classroom:

	Attentive		Quick		Distracted
	Motivated		Independent		Unmotivated
	Responsable		Carefree		Slow (on tasks)
	Reflexive		Impulsive		Dependent (on tasks)

Behavior and personality:

	Introvert		Respectful		Aggressive
	Shy		Adapted		Unsafe
	Docile		Restless		Disrespectful
	Insecure		Outgoing		Unsociable
	Quiet		Daring		

Family/School relationship:

Constant collaboration	
Collaboration only when the school demands it	
Constantly demanded by parents	
Not possible due to:	

5. EDUCATIONAL DIFFICULTIES DERIVED FROM THEIR CONDITION, RELEVANT WHEN CARRYING OUT THE ADAPTATION:

- The way a child with low vision perceives the world is not the same as that of sighted children.
- The school has to respect the developmental specificity of the child through didactic actions that guarantee their normalization with the environment. Low vision supposes a qualitative and quantitative decrease in the information that the subject receives.
- There are difficulties in learning by imitation, so we must use techniques based on non-visual aspects for this type of learning.
- Excessive effort to read, even shorter texts. Difficulty reading their own writing, with the consequent lack of control over them.
- Staying in uncomfortable and harmful postures when reading or writing.
- Excessive slowness in reading.
- Poor handwriting.
- It is essential to clarify the rules regarding the order, type, and time of intervention in communication situations: requesting speakinging time, moderators…
- The reality we refer to when giving orders: terms such as: “there, this, that, he”… do not provide information.

- The pace, both in the development and in the interpretation of graphic representations, will always be slower.
- Accuracy and formal presentation should not be valued with generalized criteria, but with verbal support, basic to strengthen their work or warn on possible mistakes made, both during the interpretation and in the development process.
- Knowing, handling, representing, and internalizing a wide range of resources will be reflected in the development of their abstraction capabilities, in the development of generalization strategies, and in the construction of natural categories of greater complexity.
- They can have problems to generalize and form categories, because the experience they have with the real world is still very scarce.
- Visually impaired children think that everyone sees the world like them.
- A non-acceptance of their visual impairment on the one hand, and the impossibility of learning gestures and reactions through imitation on the other, can determine situations of isolation or social incompetence.
- The curriculum must contain the same educational objectives, emphasizing cognitive, social-emotional and motor development, self-image, language, and communication. The acquisition of a positive self-concept, healthy attitudes, and independence are stimulated. These goals also serve as the foundation for the child's curriculum.
- Lack of progress in a student should not be viewed as a failure, but rather as a need to find the appropriate educational method to meet the individual needs of the child. Therefore, the best practice is to carefully and systematically monitor the child's attitudes and the educational methodologies applied in the classroom.
- It is also very important to have the help and intervention of their classmates, who little by little will get to know the student with visual impairment and learn how they can all participate together in their inclusion. The presence of a student with visual impairment in the classroom is beneficial for the rest of the students due to the values it transmits, the need to use different materials, etc.
- Classmates must learn to respect differences, to adapt games so everyone can participate, and to value specific material for students with visual disabilities. All of this is important for social and educational inclusion to be successful.

6. ADAPTATION

ADAPTATIVE MEASURES OF ACCESS

HUMAN RESOURCES	YES	NO
Use alternative means to meet the different curricular objectives.		
Verbalize what is written on the board, avoiding the use of a traditional one.		
Repetition in the presentation of information.		
Encouraging the student to participate and interact with their classmates.		
Consider the support teacher as an essential element inside and outside the classroom, with whom they continuously cooperate and coordinate.		

Assistance of the support teacher, without creating privileged situations for the student.		

TECHNICAL AND MATERIAL RESOURCES I	**YES**	**NO**
Provide the student with specific material if the activity requires it.		
Digital documents instead of photocopies.		
Adapted websites or links that have the necessary zooming.		
Loud readings to work on comprehension, attention and memorization.		
Use of digital notebooks.		
High-contrast materials and pictures.		
Visual rehabilitation and stimulation programs.		
Lectern/folding table.		

TECHNICAL AND MATERIAL RESOURCES II	**YES**	**NO**
Installation of specific tools and teaching materials.		
Magnifying glass.		
Tablet/PC.		
Screen magnifiers.		
Web cam.		
Digital board.		
Monitor connected to the whiteboard.		
PDFs.		
APPs.		
Text readers (vocie over).		
Seek a multisensory education, as a complementary source or, where appropriate, alternative information.		

ORGANIZATION RESOURCES – SCHOOL	**YES**	**NO**
A comprehensive knowledge of the different areas through which the student has to navigate.		

Prior knowledge by the student of the school's spaces: - Fixed elements: location of columns, windows, gaps… - Mobile elements: classrooms, location of tables, bins, furniture…		
Elimination of obstacles and architectural barriers that hinder accessibility.		
Provision of spaces where the student will receive support.		

ORGANIZATION RESOURCES – CLASSROOM	**YES**	**NO**
Lighting control: avoid backlighting and glare.		
Location in an area close to the teacher and to classmates who support them and promote their integration in the classroom.		
Fixed organization of the different elements, and express warning in case of their modification.		
The whiteboard is visible enough or accessible with access devices like cameras, screens connected to them, etc.		
Need for flexible groups.		
The work table should be wide enough to organize all materials (consider that the size of the devices and materials is considerable).		
Folding table to avoid harmful back postures.		
The classroom has a digital whiteboard and enough plugs to connect monitors, webcam ...		

CURRICULAR MEASURES **NW (not working); NS (not sufficient); IP (in progress); A (achieved)*

KNOWLEDGE OF ONESELF AND PERSONAL AUTONOMY – 2nd CYCLE - Selection of evaluable learning results.				
THE BODY AND THE OWN IMAGE	NW	NS	IP	A
They orient themselves in the school from their daily personal experience.				
They identify the notions of directionality in their own body.				
They correctly point out the main parts of their body.				
They name their parts of their body and of others.				
They notice basic differences and similarities between people.				
They draw a full body outline.				
They recognize the physical changes on themselves and others due to the passage of time.				
They identify laterality in their body and in space.				
They show progressive control of motor possibilities in different situations and activities.				
They know the basic needs of food, hygiene, and rest.				
They control their basic needs for food, hygiene, and rest.				
They are confident in their ability to meet those needs on their own.				
They have an accurate and positive self image.				

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They distinguish between senses and identify sensations through them.				
They identify feelings, emotions, and needs.				
Thye express feelings, emotions, and needs, and are sensitive to those of others.				
They show control over their emotions.				
They show respect for others, valuing differences and having helpful and collaborative attitudes.				
GAMES AND MOVEMENT	NW	NS	IP	A
Actively participates in different types of games.				
Shows coordinated motor skills.				
Enjoys their motor achievements.				
Shows fine handling skills.				
Shows interest in learning new handling skills.				
Shows coordinated motor skills.				
Regulates the expressions of feelings and emotions related to games through their language.				
Knows the basic movement orientation and coordination notions.				
Adapts their posture to different games and situations.				
Respects rules in games.				
Values the importance of rules in games.				
Enjoys collective games.				
DAILY LIFE AND ACTIVITIES	NW	NS	IP	A
Performs some common daily life activities independently, using spaces and materials appropriately.				
Enjoys carrying out the usual classroom activities.				
Accepts small responsibilities in the classroom.				
Recognizes their possibilities and limitations in carrying out tasks; asks for help when needed.				
Plans and find what is necessary to perform tasks.				
Shows constance in the performance of taks.				
Pays attention when carrying out an activity.				
Proposes activities related to a specific task.				
Enjoys a job well done.				
Shows collaborative attitudes with peers in daily activities.				
Shows collaborative attitudes with adults in daily activities.				
PERSONAL CARE AND HEALTH	NW	NS	IP	A
Recognizes actions and situations that favor health.				
Practices healthy lifestyle habits that favor their personal development.				
Performs some common daily life activities independently, using spaces and materials appropriately.				
Asks for help when needed.				
Accepts help from others.				

Has an interest in keeping a clean and neat appearance.				
Collaborates in ordering and cleaning their surroundings.				
Accept the rules of behavior in meals, travel, rest, and hygiene.				
Knows how to explain him/herself when they feel bad.				
Recognizes and avoids risky situations.				

KNOWLEDGE OF THE ENVIRONMENT – 2nd CYCLE - Selection of evaluable learning results.				
PHYSICAL ENVIRONMENT: ELEMENTS, RELATOINSHIP AND MEASURE.	NW	NS	IP	A
Handles objects and materials to discover their properties.				
Takes care of their own and other people's objects.				
Knows and respects the rules of use and safety of objects.				
Analyzes perceptual characteristics of materials through senses.				
Makes brief oral descriptions explaining the shape, color, weight, and texture of objects.				
Classifies objects using different perceptible criteria.				
Investigates objects to make scientific discoveries.				
Make simple hypotheses anticipating possible outcomes (what if…).				
Makes collections establishing relationships of similarity, difference, order, class, and quantity.				
Graphically represents relationships between items or collections.				
Uses ordinals in their everyday life.				
Uses cardinal numbers with functionality in different situations of their daily life.				
Uses their fingers to count and solve problems.				
Associates cardinal numbers with quantity.				
Uses imprecise quantifiers.				
Plays with number series (orally, with their body, and with objects).				
Knows significant numbers in their life.				
Writes numbers with a practical sense.				
Explains and solves mathematical problems in everyday life.				
Tries to guess results through mental calculations.				
Perceives and differentiates magnitudes: weight, temperature, time, length, and area.				
Compares and contrasts objects, animals, or people by measurement.				
Follows simple directions to locate their body and objects in space.				
Uses spatial and temporal notions properly.				
Identifies and interprets the days of the week, months of the year, and important events on the calendar.				
Uses their body as a natural element of measure.				
Uses and interpret conventional and social measurement tools.				
Becomes increasingly aware of the events and routines of their life.				
Recognizes and discriminates both flat and three-dimensional geometric shapes in the environment.				
Applies geometric shapes in different creations.				

Identifies and manipulates real coins and bills through games.				
Establishes price-product relationships.				
APPROACH TO NATURE	NW	NS	IP	A
Knows and names living and lifeless elements of nature.				
Compares elements of nature to see what they have in common.				
Conducts experiments to try to guess what will happen. Starts using the scientific method (trial and error).				
Often wonders how and why things happen.				
Draws conclusions from their observations.				
Develops a taste for experimentation.				
Takes care of animals and plants to learn about them (having their characteristics as an object of study).				
Observes and records fundamental aspects of the life cycle.				
Compares the life of an animal or plant with theirs or of their peers.				
CULTURE AND LIFE IN SOCIETY	NW	NS	IP	A
Names and describes social groups of reference and the members that compose them.				
Identifies and values the work that people do: trades and jobs.				
Identifies and classifies means of transport based on different criteria.				
Knows some road safety regulations and acts respecting them.				
Recognizes some means of communication.				
Participates in visits to places of entertainment, learning from them.				
Accepts the rules set by others and abides by them.				
Collaborates and participates in making decisions about the important things done in class.				
Expresses him/herself with loving words and gestures towards their classmates and adults to resolve conflicts.				
Assumess a role in activities carried out with different groups.				
Develops an attitude of respect and collaboration towards all their peers without any kind of discrimination.				
Participates in activities related to the cultural life of their environment.				
Meets relevant people in your environment and values their cultural contributions.				
Participates in activities to learn about other cultures, establishing the similarities and differences between them.				

LANGUAGE: COMMUNICATION AND REPRESENTATION – 2nd CYCLE				
VERBAL LANGUAGE – Listening, speaking, and chatting.	NW	NS	IP	A
Expresses themselves orally clearly and correctly in diverse situations with peers and adults.				
Tells their experiences following a logical temporal order.				
Uses sentences with correct structure and intonation.				
Uses a varied vocabulary in different communication situations.				

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Applies oral language to tell facts, stories, and describe people.				
Participates in dialogues and group conversations.				
Understands and expresses ideas and feelings orally.				
Respects speaking times and the rules of group communication.				
Shows an attitude of attentive listening towards classmates and adults.				
Uses simple routine social formulas in a foreign language.				
Understands simple instructions and requests in a foreign language.				
Is encouraged to express themselves in a foreign language, accepting it as a new means of communication.				
VERBAL LANGUAGE – Approach to written language.	NW	NS	IP	A
Shows interest in written texts in their environment.				
Distinguishes the letters and phonemes that make up the alphabet.				
Uses writing with communicative intent.				
Uses writing as a means of communication and information.				
Writes the names of some classmates and significant words.				
Uses writing materials appropriately.				
Is careful in his/her work.				
Differentiates the segmentation of words (syllables) by hearing.				
Associates each grapheme with its phoneme.				
Composes and decomposes words and sentences as a game.				
VERBAL LANGUAGE – Approach to literature.	NW	NS	IP	A
Listenens to and enjoys stories, poetry, riddles, charades, and simple tongue twisters as a source of learning and enjoyment.				
Understand simple stories, poetry, and riddles as a source of learning and enjoyment.				
Tells stories or tales using correct sequences of events.				
Makes up stories with minimal narrative structure.				
Shows interest in stories and various library materials.				
AUDIOVISUAL LANGUAGE AND ICTs (INFORMATION AND COMMUNICATION TECHNOLOGIES)	NW	NS	IP	A
Can tell what they see in images or videos.				
Compares different images.				
Uses the audiovisual and technological means of the school environment as a means of enjoyment, creation, and learning.				
Differentiate reality from fiction.				
Recognizes parts of a computer and its peripherals.				
Properly turns on and off a computer.				
Manages educational programs to apply acquired knowledge.				
Identifies and verbalizes the feelings and emotions caused by an image, movie, or piece of animation.				
Values audiovisual productions as a means of learning and enjoyment.				
ARTISTIC LANGUAGE – Artistic expression.	NW	NS	IP	A

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Expresses ideas, emotions, or fantasies through their artistic productions.				
Applies different basic artistic techniques in their productions.				
Trusts their own plastic possibilities.				
Describes works of art.				
Creates personal artistic works from the observation of another work of art.				
ARTISTIC LANGUAGE – Musical expression.	NW	NS	IP	A
Differences between noise, silence, and music.				
Discriminate between bass/treble and slow/fast sounds.				
Explore the possibilities of their body as a sound instrument.				
Identifies sounds of different percussion and string instruments.				
BODY LANGUAGE	NW	NS	IP	A
Expresses their own feelings through gestures and movement.				
Uses precise body movements.				
Keeps balance in their body movements.				

METHODOLOGY

	YES	NO
Before starting with a new learning, briefly explain what is going to work on.		
Structure and order the achievements necessary for this specific learning to take place.		
Propose activities with different degrees of difficulty as challenges for the students.		
Adaptat long sentences to shorter ones that facilitate reading.		
Explanations must be descriptive, and whenever possible, students will manipulate objects and materials.		
When all students participate in activities where information comes mainly by visual means, provide the student previously with supplementary information.		
Carry out the activities directly in the PDFs to speed up the work pace.		
Some words (there, here, etc.) make sense only when coupled with gestures. In these, better use verbal references like: to your right, to your left, etc.		
Explanations that require the use of the blackboard must also be described orally.		
Design activities that enable interaction and joint work among students as cooperative learning experiences.		
Include content and design activities that bring students closer to the world without vision.		
Make explanations individually.		
Introduce early study techniques to strengthen the selection of contents.		
Provide diagrams to the student before explaining the subject.		
Provide them with the audiovisual materials used in the lesson.		
Use matte paper to avoid reflections.		
Give extra time to activities, acquisition of learning processes, and actions when needed.		
Modify the learning schedule if there are contents that need more time.		
Anticipate the necessary extra time for manual or precision precision activities, modifying the schedule if necessary.		

EVALUATION

	YES	NO
Oral tests.		
In addition to oral tests, written tests with an appropriate font size will be used.		
Extra time for reading or writing activities.		
Additional support materials for exams.		
The content of the answers is evaluated, not the spelling or composition of the text.		
Reading the test questions to the group helps individually.		
Extra time for exams, 50 extra minutes by law.		
Adapted exams with visually accessible exercises.		
Adapted exams to avoid excessively long times.		
Less specific weight to components with visual contents (graphic representations, etc.).		

In _____ , on the _____ _____ 20___

Signed: teacher/ tutor

Signed: teacher/ tutor of Therapeutical Pedagogy / specialist of Therapeutical Pedagogy

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Looking out for a School for All

COURSE FOR
PRE-PRIMARY SCHOOL
TEACHERS

DIDACTIC UNIT 9

BRIDGES TOWARDS PRIMARY AND SECONDARY EDUCATION

Looking out for a School for All

This is the educational material uploaded to VIRTUAL INCLUSIVE EDUCATION and developed by REDTREE MAKING PROJECTS in collaboration with SMALLCODES SRL, ASOCIACIÓN ALBA, ANIRIDIA EUROPE, ANIRIDIA NORGE, and ANIRIDIA ITALIANA within the project “LOOKING OUT FOR A SCHOOL FOR ALL: EARLY EDUCATIONAL INCLUSION FOR STUDENTS WITH LOW VISION”, co-funded by the ERASMUS PLUS PROGRAMME OF THE EUROPEAN UNION.

Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission.
This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the
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of the European Union

COURSE FOR PRE-PRIMARY SCHOOL TEACHERS

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"Ideal teachers are those who become bridges over which their students can cross, and after having facilitated their crossing they collapse with satisfaction, encouraging them to create their own bridges."

- Nikos Kazantzakis

OBJECTIVES OF THE DIDACTIC UNIT

At the end of this didactic unit, you will:

- Have a greater knowledge of the educational needs of students in primary and secondary education with visual impairment.
- Become familiar with the adaptations of access to the school curriculum, and with the teaching strategies to be used in each area of these educational stages.
- Know the guidelines for using available resources to meet the educational needs of visual impairment in primary and secondary education classrooms.
- Establish the importance of the use and integration of ICTs in primary and secondary education.
- Evaluate ICT educational resources that favor communication in visually impaired students.
- Design an action plan with educational and didactic activities to be carried out with students with visual impairment through ICTs.

INTRODUCTION

It is in the primary education cycle when students complete their first stage of compulsory education. During this period, students grow cognitively, affectively, socially, and motorly, leading to important changes in their development. The adequate development of these aspects is decisive for the academic performance and socialization of the student, especially for students with visual impairment, as we saw in Unit 3. Therefore, knowledge of the psycho-developmental characteristics of primary education students by the teachers is essential to achieve an effective and efficient educational and pedagogical

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intervention (Castillo, 2009)[1]. Also, the increase in the inclusion of persons with disabilities in schools highlights the need to train teachers in the various methods and didactic and educational materials available to duly help these students.

Both in the teaching degree and in the master's degree for secondary school teacher, the academic profile of teacher can be said to be general in nature. Although there is the option of studying the mention of "Attention to Diversity", in which aspects of disabilities are taught, we cannot expected that any teacher knows and uses everything that is now required to face the inclusion of students with disabilities in the classroom. By this, we mean that this mention of "Attention to Diversity" does not provide the same level of training to meet the needs required by a student with a sensory disability as with another type of disability.

With this topic, we want to spread the knowledge of visual disability within the educational environment through the existing bridges between the development of pre-primary education and primary and secondary education, so teachers become aware of reality, at a theoretical and practical level, to have a better pedagogical function with their students - in other words, to transfer the knowledge of what the needs of students with visual impairment in these educational stages are, so teachers can apply different strategies and learning methods, and to help them use different pedagogical materials available in their classroom.

9.1 ADAPTATIONS OF ACCESS TO THE SCHOOL CURRICULUM

Based on the guidelines established by Álvarez (2000)[2] and those that Andrade (2011)[3] follows in his guide -emphasizing the adaptations of access to the school curriculum- in this chapter we will try to specify which adaptations may be needed in the different areas of primary education for children with visual disabilities, due to the learning difficulties linked to their sensory impairment.

Following the aforementioned reference model, the answers will be framed within the general context in which learning takes place, establishing an intimate relationship between the student's conditions and the teaching strategies to be introduced.

9.1.1 KNOWLEDGE OF THE NATURAL, SOCIAL, AND CULTURAL ENVIRONMENT

This learning area proposes various objectives related to the development and personal and social autonomy of the child with visual impairment. The environment, be it natural, social, or cultural, is what shapes and structures the way of being in the world. In this area, the contents, concepts, or procedures

[1] Castillo, R, P. (2009). Desarrollo psicoevolutivo en niños de 6-12 años. Revista digital "Innovación y experiencias educativas", 14.
[2] Álvarez Gámez, F. (2000) Acceso al currículo. Didáctica y adaptación en las áreas curriculares generales. En: Martínez, Liébana, I. (coord.). Aspectos evolutivos y educativos de la deficiencia visual. Madrid, ONCE
[3] Martín Andrade, P. (2011): Guía de orientación para la inclusión de alumnos con NEE en el aula ordinaria. Alumnos con discapacidad visual Necesidades y respuesta educativa. Escuelas católicas.

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that may present greater difficulties are those for which vision is a primary character. Persons with impaired sight will find special difficulty in understanding the most distant physical environment (such as stars and planets), and in the descriptions of other environments and landscapes to which he/she is not used.

Some adaptation criteria to be used are:

- Enriching perception by promoting the sensorial plurality of approach to reality.
- The variety of perceptions and descriptions of peers as a source of information for the child.
- Handing them models, sketches, and plans in relief so they can interpret them.
- The oral description of visual physical realities difficult for them to access due to their type of perception.

On the other hand, regarding "how" to teach, some observations that are considered essential in the methodology of this area, in addition to the general principles:

- The teacher has to use procedures that invite students with low vision to use experimentation and methodical observation, focusing on objectivity and the systematic organization of experiences.
- It is necessary to know that the child's learning pace may be slower in some subjects, so it may require carrying out specific or additional tasks.
- The task of developing specific materials for the better understanding of contents does not always have to fall on the teacher: it can be transferred to the imagination of the classmates, so they can envision and create them themselves.

9.1.2 ART EDUCATION

Art education develops the necessary capabilities to carry out two basic processes: the perception and interpretation of physical, musical, and dramatic representations, and the expression of feelings and ideas through those same means. In this processes, it is vital to understand:

- How children with low vision perceives the world.
- The information gathering process through the haptic system.
- The difference between the information obtained by this system and that collected through sight.
- What techniques and strategies the child knows and uses to obtain and retain information.
- What characterizes their mental images and how they can represent them.

The first of the axes (perceiving and interpreting) is developed in the earliest stages of school, through recreational activities carried out mainly in the same classroom or in the school. In them, students develop auditory and tactile perception, perception of shapes, spatial orientation, and body scheme, while establishing group relationships that favor the appearance of positive social attitudes (see the development of students with visual impairment in Unit 3). As they advance, these activities lose their playful side and offer the possibility of perceiving and interpreting artistic realities distant from the immediate environment and of greater complexity: museums, concerts, exhibitions, theatre, etc.

Depending on variables such as the student's expectations, their degree of vision, previous experiences, level of integration, etc., the teacher should be able to adapt the objective they intend to achieve with a given activity.

The second of the axes (expression and communication) is conducive to carrying out activities that involve different groups of the educational community. This is the case, for example, in the exhibition of works made by students, the decoration of the school, the staging of theatrical works, or music or dance performances. These collective activities are based from the start on teamwork, so they constitute an excellent means for interpersonal relationships and to discover individual interests, motivations and abilities. If students with visual impairment participate in a play, they need to have access to the necessary resources to obtain the information that their classmates get with their sight: stage size, stage set and its distribution, the location of exits and entrances, possible obstacles, and also clear reference points for their movement while in stage.

Regarding the adaptation and access to the materials, the quantity and variety of resources that can be used in this area is an advantage, since this diversity guarantees the exploration and sensory manipulation of materials with different characteristics and possibilities of use, while allowing the teacher to replace those with difficulties of use or adapt with another.
Next, we will look at the contents included in this area and their didactic treatment:

a) Arts:

Some contents, especially related to color and visual aspects, will require adaptations guided by the following basic criteria:

- Replace the contents (procedures), whenever possible, with an "equivalent" one accessible to visually impaired children. For example: substitute colors for textures, but bear in mind that each perception channel has its own characteristics, and that just a substitution is not an adaptation.
- Value the development and creation process more than the final result.
- Pay individual attention in the monitoring and evaluation of the procedure.

Lastly, drawing deserves a special mention for its didactic value; it is a form of graphic representation of great importance as a means of expression. Arts, in addition to having applications in the learning of other areas, allow developing fine motor skills and haptic-manual skills. Also, drawing will show us the mental image that the student has of the different elements that surround them and their spatial relationships.

b) Music and drama:

Music is an area in which students with visual disabilities can easily integrate into the group, since it prioritizes the sense of hearing. However, it will also allow us to offer them multi-sensorial experimentation situations, especially with kinesthesia. The teaching and learning of musical expression and production will be carried out through three different means: voice and singing, music instruments, and movement and dance.

1. Through singing we develop memory, auditory discrimination, imitation, and vocal development. Gestured song also provides information about the non-verbal codes that accompany language.
2. The use of percussion instruments and the study of an instrument favor the development of laterality, the sense of rhythm, motor control, and awareness of space and time. On the other hand, the study of musical signs favors the development of abstract skills and a sense of order.
3. Dancing also develops the sense of rhythm and contributes to the awareness of our own body and the internalization of the body scheme, in addition to developing the necessary skills to know and master space.

Some guidelines provided by ONCE's team of music specialists regarding this topic are:

- The music classroom: it is necessary for students to know the place where music will be taught, and which and where are the materials that they are going to use, also warning them of any change in their placement.

- Body expression: when designing body expression activities, there should be physical contact (holding one or both hands, hand resting on shoulder or arm, etc.). In this way, thanks to this point of contact, visually impaired students will always have a reference with their classmates, and will be able to carry out activities with greater security. In activities where walking is necessary -like a staged performance, or in any type of dance- it is essential that the student learns to move through the space to be used if it is outside the classroom, locating all the elements that may pose an obstacle to mobility and that are necessary in the representation (including size and shape of the area, accesses to it, and location in relation to the other spaces to be used).

- Musical language: it is important to have the technical aids prescribed, also in the music classroom, to facilitate students with low vision their reading and writing. At first it will be necessary to use material in relief to represent the qualities of sound: cards with conventional musical figures, staves to use with stickers, or adhesive velcro tokens to use as musical notes, etc.

- Plate instruments: except in very exceptional cases of proven simplicity, we should not expect the simultaneous use of two drumsticks in exercises done by a child with visual impairment. This technique requires training based on motor memory, through which we store distances and locations related to the movements of the drumsticks on the instrument. First we must allow the child to touch the plates smoothly and successively with their free hand, in the same order that the melody should be produced, as an orientation for the hand handling the drumstick.

- The flute: we recommend the teacher not act just as a model, adopting the correct position when handling the instrument and trying to get the student to imitate it through tactile perception. In this case we must substitute imitation for correction: the ideal flute placement, the proper way to blow air, the articulation of the tongue to achieve short and repetitive sounds, and the placement of the fingers following a logical difficulty order should be the indicators that show us the way to achieve mastery of the instrument. The use of the numbering of the holes is interesting to remind the blind student of the different combinations necessary to obtain the different musical notes, starting from 0 to designate the hole on the back, and 1 to 7 for the rest. This system can replace visual graphics,

being able to write the entire list of possible combinations -notes- for the student with visual impairment.

- Directing strategies: in addition to doing it visually with the hand or the baton, soft whistles or light percussions should be agreed to in advance and perform to indicate the start and ending of the piece (although it is not necessary to have these acoustic signals all the time, it is advisable to resume them if there is an imbalance of movement). The teacher should direct from a place visible to all students, but not significantly separated from the group, so he/she can couple regulations with soft phrases that guide visually impaired students.

9.1.3. PHYSICAL EDUCATION

The educational functions of this area are: knowledge and mastery of the body scheme, development of psychomotor capabilities, and access to the sensation and global perception of reality, symbolic and abstract thinking, cognition, identification of one's space and of others, aesthetic and hygienic functions, and the possibility of communication and relationship among equals.

This area requires many adaptations, so we can speak first about the didactic adaptation that the physical education teacher will carry out through the sequencing and globalization of contents. The sequencing of this area should be based mainly on procedures, selecting activities that -based on previous knowledge and step by step- facilitate harmonious and functional movements for students with low vision. As for globalization, it should be mainly directed to those aspects that are more difficult to achieve due to the nature of this impairment:

- Perception, structuring, and orientation in space.
- Perception, structuring, and relationship with time.
- Knowledge and mastery of the body as an instrument of expression and communication: gestures and movement, mimicry, dance, acting…
- Motor, symbolic, and cooperation games.

Along with the globalized treatment of the contents, the area of physical education also allows to integrate globally some of the so-called transversal themes. Andrade (2011) focuses on two of them, due to the special importance they have in the education of children with visual impairment: road safety education and education for free time. The first of these is intended to help them acquire and develop habits that allow them to move safely on the street, thus facilitating their orientation and autonomy when traveling. The second helps them against the natural tendency to a sedentary lifestyle, and to open up the possibility of their adult leisure activities being more active, by stimulating an appeal for movement and the need to exercise.

With some simple adaptations, the child can start practicing some sports like: athletics in its different modalities, swimming, tandem cycling, futsal, judo, weightlifting, mountaineering, skiing, or *goalball* -the only specific sport for blind persons-.

Lastly, this area uses in many of its developments an aided methodology, which is specified in the following action guidelines:

- Children with visual impairment will sometimes need a guide for walking and running.
- For certain activities, the teacher or a classmate will be the model through which they perceive movement and posture.
- They will also explore slowed down movements of the model to incorporate them into their own body scheme.
- It will be necessary to incorporate elements into the game that allow a clear differentiation (red and blue clothing or markings in team games, for example).
- The landmarks in a circuit or route must be marked.
- The access of children with low vision to certain physical/sports exercises will be solved with the incorporation of a sound, like clapping.
- Although an excessively verbal methodology has sometimes been deemed as negative, the truth is that verbal support seems absolutely necessary. The clarity of information facilitates an adequate conquest of the movements.
- The repetition of mechanical movements is very necessary until they become automated.

9.1.4 LANGUAGE AND LITERATURE

The contents that constitute the area of language and literature have a close relationship with the rest of the areas, since they provide the basic tool to carry out their learning. Furthermore, language, in the case of visually impaired people, is not only the most valuable tool of knowledge and communication, but also the means to understand the outside world, the main substitute for visual information.

Based on the guidelines established by Andrade (2011), here are some specific observations about contents that appear in the curriculum: oral and written communication (reading and writing).

Oral communication

As we have stated throughout the course, it is necessary to carry out an initial evaluation to establish the child's level of oral communication. Some conditions imposed by visual impairment must be taken into account when addressing the contents of oral communication:

- Although, according to this author, the acquisition and development of language in a child with visual impairment does not seem altered, some studies state that lexical richness can be affected, which conditions two basic language uses: understanding and expression. If this is the case, enriching the child's vocabulary with direct and close experiences will help to improve their knowledge of reality.
- It is also necessary to consider the intervention of the haptic and auditory systems as mediators of learning, the use of verbalisms, and not forgetting that a lack of vision can be a barrier when starting a conversation and intervening in communicative situations, so the author proposes a series of measures:

- Specify how many persons are participating, who they are, where each one is, if someone is a moderator…
- Establish norms regarding the order, type, and time of interventions, rules to request the speaking time, the role of the moderator…
- Avoid the use of substitutive terms: "that", "this", "there", "he/she"… these do not provide information to people with visual impairment.
- Don't forget to name the reality you are referring, in any situation in which the child is present.

Regarding attention and listening, although students with low vision do not receive certain visual stimuli that would dissipate their focus, it is also true that they also do not receive visual stimuli (eye contact or everything received through sight, like glances, gestures, and movements of the sender, call signals from the teacher, etc.), which favor attention and subsequent learning. Therefore, it is necessary to identify the signs of inattention and develop strategies for the child to perceive the situation, so he/she can focus again on the oral communication they were receiving.

Written communication

Reading and writing are the two basic teachings that take place in written language, and they are the two pillars on which the entire school life is be supported. Given their significance, their importance for children with low vision comes from the correct understanding of the code (ink or Braille) that they will predominantly use. Determining which code to teach -ink or Braille- will be based on the analysis of multiple variables, including the study of their current visual situation and its prognosis. Also, when placed in the school environment, it is essential to know the academic functionality of the code; in other words, to consider whether the chosen code is going to be valid for the study in the different educational stages, or if it is going to impose limitations on proper academic tasks, leading to a lack of motivation:

- An excessive effort to read even short texts.
- Difficulty to access their own writings, with the consequent lack of control over them.
- Staying in uncomfortable and harmful postures.
- An excessive slowness in reading.
- Poor handwriting.

Blind children, in addition to the common prerequisites to learn reading and writing, will have started in the specific aspects required by the Braille system:

- Development of tactile perception.
- Independence of the fingers.
- Correct position of the hands and movements to be carried out, and proper posture.

In the adaptations indicated for the learning of literacy, it is essential that learning takes place in the classroom, in parallel to the literacy learning of their classmates, although sometimes adaptations are necessary (like with signs that can be confused with each other due to their "mirror" writing or their similarity in shape).

9.1.5 FOREIGN LANGUAGES

Here too, the child's experiences are the basis for meaningful learning. When starting a new learning, especially foreign languages that require a new code, it is common to start from facts, situations, or realities known to the child and already mastered in their mother tongue. This teaching is supported by verbal and non-verbal techniques like gestures, mimicry, dramatization, drawings… that facilitate the acquisition of the new code in multiple ways, often using images of terms and situations. This principle and method, common and favorable to this area, does not have to be avoided or eliminated, but it must be adapted, completed, and enriched for students with visual impairment. The teacher, in this case, will:

- Prioritize dialogue or conversation over visual teaching resources.
- Show three-dimensional materials or drawings in relief, instead of pictures.
- Complement with parallel explanations, in the student's mother tongue, those activities that involve recognizing scenes, gestures, or non-verbal language.

Regarding the objectives and contents, it is evident that although what we stated in the area of language is also applicable to this area, it can be completed with specific guidelines to carry out adaptations in the foreign language, such as:

- The sequencing of the contents: in pre-primary and primary education, it is appropriate to prioritize oral communication over written communication, to go from understanding to expression. Thus, while understanding oral messages from different sources (the teacher, other classmates, sounds, or audiovisual recordings) does not pose difficulties for children with low vision, adapting to the characteristics of their learning may require an individual adaptation or to complete the information, especially with the use of audiovisual materials such as:
  - oral descriptions of images by the teacher or a classmate;
  - make a written comment of a video;
  - even staging specific passages.

- On the other hand, as support in this area, there are specific materials for its development. It is necessary to highlight the use of the dictionary as a basic means in the learning of a language, especially when advancing in its knowledge. Until recently, if the student lacked enough visual remains, the adaptation had to be made by the teacher, the family, or the classmates themselves. However, as we have seen in previous topics, PCs, electronic devices, and software have alleviated this difficulty.

9.1.6 MATH

Andrade (2011) points out the non-existence of a direct relationship between visual impairment and the difficulties in learning the area of mathematics. Even so, he points out difficulties that a child with low vision may encounter in calculus and geometry.

Calculus

Several statements of the curriculum for primary education in the different blocks make direct reference to this content, highlighting the value of mental calculation and estimation. However, some of the causes that Fernández de Campo (1986) points out in producing blockages in the learning of calculus are: a poor attitude due to the abstract nature of the proposed exercises, scarce focus, the wrong use of automatisms (poorly mastered), and considering calculus tools as "instruments of torture". To solve this, he proposes to emphasize mental calculation and the later use of a calculator.

Mental calculation, long forgotten or seldom used, is once again revalued as an excellent means to strengthen self-esteem, develop concentration, focus, a reflective attitude, and the ability to link, compare, and select data. All of them are desirable side effects for any student, which will be amplified by their specific impact on visually impaired students, who should have been provided with basic strategies and skills for what will be their main operating medium. The fluency in mental calculation, later complemented with the use of the calculator, is very effective in compensating for the slowness imposed by calculation-specific tools.

Closely related to calculation is estimation, also almost absent in mathematics, based exclusively on its accuracy. But in daily life, estimates are made very frequently regarding time, capabilities, distance, or size, without the conventional tools or means needed to know exact values or results. This is why it is of great importance to work on estimation, since its mastery implies a useful knowledge of objects, their measurement, their distance from others, and the relationships between them. Estimation, along with the understanding and internalization of body units (a footlong, a span) constitute excellent tools for the approximation to real values.

This skill, useful for everyone in daily life, is of great help for children with low vision when it comes to recognizing sizes or perceiving distances (50 steps away; three spans long…) and to face new situations or realities of difficult or impossible tactile access, in which auditory perception will frequently be complemented with the estimation strategies developed.

Geometry

There is no doubt about the contribution of the contents of this area to the development of organizational capabilities and spatial orientation, nor about their essential applications in other areas of the curriculum. Knowing the body scheme, a sufficient development of laterality, and good handling and tactile recognition skills are prerequisites to start learning geometry.

The family and school environment are full of geometric shapes that visually impaired children do not fully perceive, so their recognition will be limited to fewer than their peers, not for lack of ability, but due to ignoring the existence of many of the objects that surround him/her, which diminishes or eliminates the curiosity to discover and establish relationships between them. A clear educational consequence follows from this: the knowledge and familiarity of children with low vision with their environment will be an explicit objective in the programming carried out.

At the beginning of their schooling, handling real objects and geometric bodies is the means par excellence to ensure that the student identifies them, recognizes their characteristics, and manages to make a correct transfer of this learning to their daily activities. Moya (2014) states that, for example, thermoform sheets or drawings in relief can be used. Also, the lack of vision of the student should not condition the teacher to exempt him from activities that involve the creation or interpretation of graphic representations, on the contrary, they should favor them with the assurance that they are contributing to the development of extremely useful skills and strategies, both for their application to everyday situations and to other learning.

However, while students with low vision need to learn these contents, we also need consider the influence that visual impairment will have on them. Specific aspects to be considered are:

- The pace, both of the creation and interpretation of representations will be slower.
- Precision and formal presentation should not be judged with generalized criteria.
- Verbal support is extremely important, to strengthen their work or warn them about possible mistakes made both during the interpretation and creation process.

Lastly, the benefits for the blind child of knowing, handling, representing, and internalizing a wide range of resources are evident, and will be reflected in the development of their capability for abstraction, the creation of generalization strategies, and in the construction of natural categories of greater complexity.

9.2 ICTs (INFORMATION AND COMMUNICATION TECHNOLOGIES) AND TIFLOTECHNOLOGY

We have already previously spoken about how the technological advances of our era have changed the way of understanding education; new generations of students are born being native in the use of technologies. Thus, traditional teaching methods and strategies are falling into disuse, due to the need to adapt them to the skills and capabilities of the students and the environment. The innovation and development of new educational materials is unstoppable, making essential that schools equip themselves with the necessary technological resources, to provide teachers and students with access to information and new methods to communicate and express themselves. According to Cabrero (2001), ICTs must be used as a means, not as a source of knowledge themselves, so schools must consider a series of factors when making the decision to get new ICT resources.

One of the main aspects to consider is -as we saw in Unit 4, when addressing new technologies as a means of inclusion in the classroom- if the resource can meet the special educational needs of students with disabilities, to avoid that instead of assuming progress, the introduction of ICTs induces access-related segregation. Regarding this ICT-accessibility and inclusion, we must consider the role we have as teachers and how we can contribute to their inclusion in classrooms with diverse students. Teachers are the ultimate responsible for ensuring that each student complies with their corresponding educational program, and that they do so in the best possible conditions. It is our responsibility to know the students and manage the most appropriate resources to meet their needs, derived in this case from visual impairment, especially in primary and secondary education cycle, where -unlike in pre-primary- the use of technology extends to a daily basis as a tool in almost all subjects. Therefore, we will focus in this

chapter on pointing out tips and guidelines that allow persons with low vision to access information and communication and improve in their performance of some tasks in the educational field.

9.2.1 ACCESS TO INFORMATION ON THE COMPUTER

Computers are a basic tool for personal and school life. Their use by students with low vision in primary and secondary education is essential for most subjects, both to access relevant information and for communication. This is why accessibility conditions the total autonomy of visually impaired students, although as Toledo (2001) points out, their condition may impose a slower learning pace at first. What is essential is that all teachers know that low vision students use the same computers as their peers, with the same software, like the internet browser, Microsoft Word, Excel, etc. Furthermore, it is necessary to adapt the computer to the particular needs of each student, and this requires learning of technological resources that guarantees their effective use (Candelos and Lobato, 1997).

So, how do students with low vision access the computer depending on their visual functionality? These students, unlike fully blind students, can work with the computer screen and the mouse. Their degree of vision allows them -with adaptations- to see details and read, with due contrast and size. However, to access the computer they need the elements in the screen to be in sizes, colors, and contrast appropriate to their condition and limits, as well as specific configurations (zooming) (ONCE, 2003):

- Screen magnifier/zoom: this software allows to enlarge the whole screen or part of it, to make it more easily perceptible. It modifies features of the screen like color, contrast, size, and shapes, and usually has a series of characteristics that allow visually impaired students to navigate the screen in optimal conditions and with greater recognition. This software is easy to use, can be permanently configured, and can be easily used by students starting in pre-primary education (Gaston, 2010). Some of them worth highlighting are:
  - JAWS for Windows: it combines the ability to enlarge characters and reading screens, also with the possibility to choose what the user wants to be read when browsing through different programs.
  - Zoomtext Xtra: this software supports graph enlargements from x2 to x16 size.

A demo version of both of them can be downloaded from their respective websites. In the case of JAWS, the limitation of the demo version is just time-based, allowing 40 minutes in each work session. On the other hand, the use of the free NVDA (NonVisual Desktop Access) screen reviewer is increasing.

9.2.2 INTERNET ACCESS

Nowadays, part of the work carried out in the classrooms is based on using the internet, making it necessary to provide the appropriate means to visually impaired students to participate in an inclusive environment without risk of failure. Once we know that students with visual disabilities can access the computer, it is very important that the web environment is also accessible, to provide equal access and opportunities to persons with disabilities.

When speaking of web accessibility, we refer to a web design that allows students with disabilities to perceive, understand, navigate, and interact online, while providing contents (Serrano and Pedrosa, 2008). This encompasses many types of disabilities, including visual, hearing, physical, cognitive, neurological, and speech problems, so it is necessary to consider: how can a teacher know if the network in which he/she wants their students to work is duly accessible?

In December 2008, the WAI (Web Accessibility Initiative) published this version of Web Content Accessibility Guidelines, (WCAG 2.0), developed over a long period of time to adapt to the technological changes that have taken place in recent years, and are the guidelines currently in force internationally. In addition to these documents, extensive and comprehensive documentation on all topics related to web accessibility can be found on the WAI website, and beyond them we can also assess the degree of accessibility to the web through screen reviewers. To do this, screen reviewers automatically analyze, line by line, the HTML code of a web page, checking all the verification points of the accessibility guidelines from the WAI. When finished, they show a detailed report on the level of compliance with these guidelines, indicating the page's level of accessibility (*A*, *AA*, or *AAA*).

The most important thing about these tools is that they are a useful aid in knowing the degree of accessibility of a web page, and combined with the accessibility guidelines published by the WAI, one can carry out a full review to definitively establish the real accessibility of the page under study. Some of them worth highlighting are:

- Reviewers in Spanish: HERA13[4] and TAW14[5].
- Reviewers in English: BOBB15[6] and CYNTHIA16[7].

9.2.3 ACCESS TO LEARNING ACTIVITIES THROUGH THE SCHOOL'S ICTS

Lastly, we are going to talk about the access to learning activities through ICTs, based on Cuadrado's and Fernández's work (2009), establishing specific criteria that allow teachers to design digital educational activities with guarantees of accessibility and autonomy, i.e. with the same characteristics for students with visual disabilities as for the rest of their classmates, and pursuing the maximum autonomy of each student.

Determining factors: the way in which activities are made accessible is essentially determined by the age of the student and the objective of the activity.

- *By age of the student*, we differentiate between two types of activities:
  - Guided activities: activities are usually guided until at least the 4th year of primary education, meaning that the activity itself must guide the student in its navigation and in the accomplishment of the tasks. All elements must have a speech or sound illustration to offer the

[4] *HERA* (http://www.sidar.org/hera/).
[5] *TAW* (http://www.tawdis.net/taw3/cms/es).
[6] *BOBB* (http://www.cast.org/bobby/).
[7] *CYNTHIA* (http://www.cynthiasays.com/).

information needed by the student with visual problems. For them, access to the guided activities must also be automatic or easy accessible (for example, with a CD, a direct access in the desktop, from an educational platform, etc.).

- Non-guided activities: those that can be carried out with a screen reviewer and are generally suitable for students above the 5th year of primary school. In them, all elements must have a matching label, have to be accessible with mouse and keyboard, and must have a coherent and logical navigation order.

- *By objectives*: each activity can have one or more objectives, trying to not change them when following the accessibility criteria. However, if an activity covers several objectives simultaneously and their accessibility is different, some should be prioritized over others.

Once the previously highlighted factors have been clarified, certain requirements must be considered when designing learning activities:

- *General requirements*:
  - All activities must be able to be navigated with both mouse and/or keyboard.
  - As far as possible, all activities must start in full screen, without toolbars or scrolling.
  - If the activity has a time limit, it must be possible to expand, reduce, or disable it depending on the student's needs.
  - The student must be told by speech about the number of attempts they have made and the time spent in the activity if this information appears on screen.

- *Aspects related to the screen display*:
  - Pictures, graphs, and images have to be clear, and their objective should be easily extracted from them. In any case, they must be easily recognizable.
  - Images and texts must be sufficiently contrasted with the background.
  - Any objects must be sufficiently highlighted.
  - The pointer or its thickness and contrast must be customizable.
  - The different types of messages (start, finish…) must be differentiated (with differences in color, size, brightness…).

- *Texts*:
  - In general, all texts in the exercises must be editable, so that they can be interpreted by the tiflotechnical tools used by the student.
  - If texts appear as images, they must have an associated sentence explaining what it says (for guided activities), or a description that can be read by a screen reader (for non-guided ones).
  - The font size for any activity must be at least 14.
  - The font must be clear to read, as close as possible to "Verdana" or "Arial".
  - The texts must be well contrasted and highlighted against the background.

- *Sound and speech*:
  - On the first screen of any guided activity, there should be an initial presentation of the scenario and the activity itself, in which students are informed about which key to press to access the toolbar, and to return to the activity again.
  - When changing the screen to start any new activity, there must be another explanation with the specific instructions to solve the new exercise.
  - Applications must include continuous or intermittent sounds to notice the student that they are active. Both the sounds of notice and loading will be soft and low in volume, so they do not interfere with the sounds of the activity.
  - The actions involved in an activity must have a sound linked to them: "select element", "release", "end of activity", "hit", "miss", "successful end of activity", "unsuccessful end of activity with"… Any change that can be seen on the screen must have a matching sound, so the student always knows that something has happened.
  - Any feedback message (hit, miss…) has to be audible. These sound messages of positive reinforcement and continuity will be more necessary in all activities the younger the student is.

9.3 ACTIVITIES

- **Choose a specific topic within one of the areas of knowledge for the 3rd year of primary education, and try to design an adaptation of access to the curriculum for a student with Aniridia or Albinism (residual vision of 20%). What adaptations would you make to the materials, and what learning strategies would you follow?**
  Send us your proposal through the e-learning platform, and our entities and experts will evaluate, correct, and help you with the adaptation.

  **** An example: Knowledge of the natural environment > living beings > plants.***

- **Based on the Web Content Accessibility Guidelines published by the Web Accessibility Initiative (WAI), and with the help of the aforementioned screen readers, analyze and evaluate the degree of accessibility of the websites you use in the classroom.**

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Looking out for a School for All

COURSE FOR
PRE-PRIMARY SCHOOL
TEACHERS

DIDACTIC UNIT 10

THE ERASMUS PLUS PROGRAMME AS AN EDUCATIONAL TOOL FOR STUDENTS WITH LOW VISION

Looking out for a School for All

This is the educational material uploaded to VIRTUAL INCLUSIVE EDUCATION and developed by REDTREE MAKING PROJECTS in collaboration with SMALLCODES SRL, ASOCIACIÓN ALBA, ANIRIDIA EUROPE, ANIRIDIA NORGE, and ANIRIDIA ITALIANA within the project “LOOKING OUT FOR A SCHOOL FOR ALL: EARLY EDUCATIONAL INCLUSION FOR STUDENTS WITH LOW VISION”, co-funded by the ERASMUS PLUS PROGRAMME OF THE EUROPEAN UNION.

Co-funded by the Erasmus+ Programme of the European Union

This project has been funded with support from the European Commission.
This publication [communication] reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Co-funded by the
Erasmus+ Programme
of the European Union

COURSE FOR PRE-PRIMARY SCHOOL TEACHERS

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"Much more than a financing program, Erasmus Plus has become an open gateway to Europe and the world for our young generations."

- Mariya Gabriel

OBJECTIVES OF THE DIDACTIC UNIT

At the end of this chapter, you will:

- Know what the Erasmus Plus Programme is, and its characteristics.
- Know the opportunities offered by the Erasmus Plus Programme to finance projects and mobility activities of pre-primary education teachers.
- Know the Results Platform, a unique opportunity to find resources and educational results in terms of inclusion that are the result of the work and efforts of teachers, schools, institutions, and companies from all over Europe.
- Learn about the tools linked to the Erasmus Plus Programme for teacher networking, especially the eTwinning and School Education Gateway platforms.
- Discover ideas for projects related to low vision.

INTRODUCTION

This training course for teachers of pre-primary schools is framed within the Project "Looking out for a School for All: Early Educational Inclusion for Students with Low Vision", developed by REDTREE MAKING PROJECTS COOP. V., along with ALBA (Spain), ANIRIDIA EUROPE, ANIRIDI NORGE (Norway), ANIRIDIA ITALIANA (Italy), and SMALLCODES (Italy). The ERASMUS PLUS PROGRAMME approved to financially support this project through the Spanish National Agency - SEPIE on the year 2018.

This program is a European initiative that supports the structuring of a common space and offers its participants -especially school teachers- a unique opportunity to develop their personal and educational skills and carry out learning between equals from the most innovative inclusive projects in schools

across Europe. This Unit intends to show all users of the course this opportunity that we support without a doubt, and believe that it can specifically contribute to improve the quality of teaching in early ages and support the hard work of teachers of these levels. This is why we decided to include this Didactic Unit, to allow you to learn more about these opportunities and encourage you to benefit from them in the future, perhaps with a stay abroad (through volunteering or in a mobility activity), by actively participating in a project that helps to improve the working capabilities of an association or school, or by accessing the multiple platforms and resources that the Programme offers to teachers.

Both in the sections that you will find below and in the downloadable contents, we will help you understand what this program is, what it is for, how you can participate in it, and where to find more information about it.

10.1 EXPLANATION OF THE PROGRAMME

Erasmus Plus is the EU program to support education, training, youth, and sports in Europe. Its budget of 14,7 billion € has provided more than 4 million Europeans the opportunity to study, train and gain experience abroad. But Erasmus Plus –with a duration from 2014 to 2020, and a new continuing program from 2021 to 2027– is not only aimed at students but also at teachers of all fields and at youth in general. As the result of the merging of seven previous programs, it offers opportunities to a wide variety of persons and organizations.

Work in the fields of education, training, youth, and sports can be an important help in addressing social and economic changes, the main challenges that Europe will face during this decade, and in supporting implementation of the European Political Agenda for growth, employment, equity, and inclusion. The program is a very useful tool on the European scale, helping to combat the educational inequalities generated as a result of barriers and obstacles for students with SEN.

The efficiency of education and training systems and youth policies provide people with the skills required nowadays by the labor market and the economy, while allowing them to play an active role in society and achieve the full potential of life and their personal development. Reforms in the fields of education, training, and youth can reinforce the process towards these goals, based on a shared vision among policy-makers and stakeholders, strong evidence, and cooperation in different fields and levels.

The Erasmus Plus Programme is designed to support the efforts of participating countries to efficiently use the potential of European human and social talent, taking into account the principles of lifelong learning, linking support to formal, non-formal and informal learning in the fields of education, training, and youth. Moreover, it enables opportunities for cooperation and mobility with partner countries, especially in the areas of higher education and youth.

The Programme supports actions, cooperation, and tools consistent with the objectives of the Europe 2020 Strategy and its flagship initiatives, such as Youth on the Move and the New Skills and Jobs Agenda. It also contributes to achieving the objectives of the Strategic Framework for Education and

Training for European cooperation in education and training and the European Strategy for Youth, relying on open methods of coordination.

This high investment in knowledge, skills, and competences will benefit individuals, institutions, organizations, and society as a whole, as it contributes to growth and to ensuring equality, prosperity, and social inclusion in Europe and beyond.

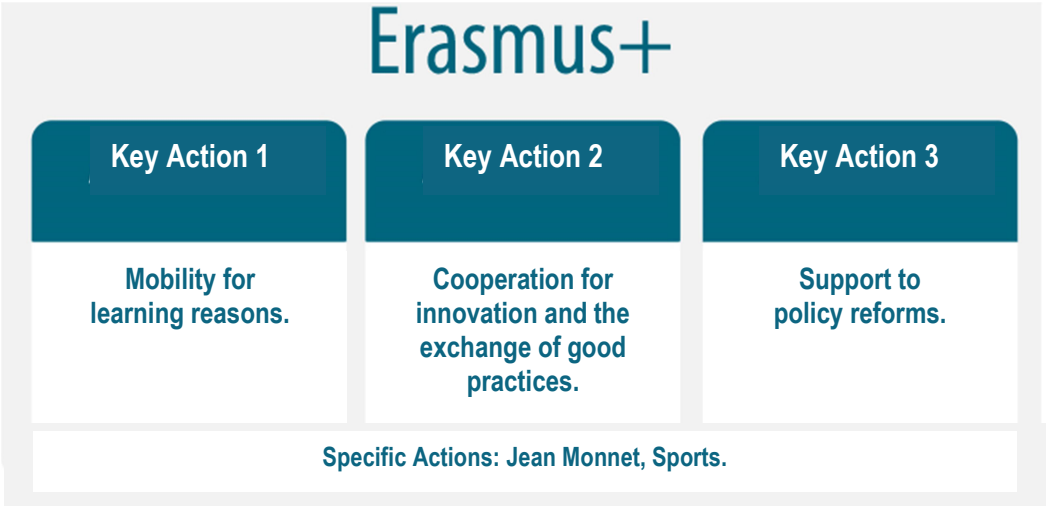
10.2 OBJECTIVES OF THE PROGRAMME[1]

The Erasmus Plus Programme has as its main objectives the achievement of:

- The objectives of the Europe 2020 Strategy, including the main objective on education.
- The objectives of the Strategic Framework for European cooperation in the field of education and training (ET 2020), with its corresponding benchmarks.
- Sustainable development of partner countries in the field of higher education.
- The global objectives of the renewed Framework for European cooperation in the field of youth (2010-2018).
- Developing the European dimension in sports, especially in grassroots sports, in line with the Union Work Plan for Sports.
- The promotion of European values, in accordance with article 2 of the EU Treaty.

10.3 STRUCTURE OF THE PROGRAMME

To meet these objectives, the Programme finances specific projects in each of its work areas, mainly promoting:



[1] https://ec.europa.eu/programmes/erasmus-plus/about_es

10.3.1 KEY ACTION 1: MOBILITY OF PERSONS

Mobility activities in the field of education, training, and youth play a fundamental role when it comes to providing people of all ages with the necessary means to actively participate in the labor market and in society in general. Projects framed in this action promote transnational mobility activities aimed both at learners (students, trainees, apprentices, youth, and volunteers) and educators (university or other level teachers, trainers, youth workers, and workers of organizations in these fields).

On the other hand, Erasmus Plus offers more space than previous Programs to develop mobility activities involving partner organizations with different origins, active in different socio-economic areas or sectors (university students, VET students in training of internships in companies, NGOs, or public organizations, teachers in professional development courses in companies or training centers, experts from the business sector who give lectures or training in higher education institutions, companies active in Corporate Social Responsibility that develop volunteer programs with associations and social enterprises, etc.).

10.3.2 KEY ACTION 2: THE CREATION OF STRATEGIC PARTNERSHIPS

The objective of Strategic Partnerships is to support the development, transfer, or implementation of innovative practices and the execution of joint initiatives to promote cooperation, peer learning, and exchange of experiences at the European level. The activities supported by this Key Action are expected to have positive and lasting effects on the participating organizations, on the political systems they are framed into, and on the organizations and individuals directly or indirectly involved in them.

This Key Action is intended to deepen the development, transfer, or application of innovative practices at the organizational, local, regional, national, or European level. At a systemic level, they are intended to promote modernization and strengthen the response of the education, training, and youth systems in the face of the main challenges in our world: employment, economic stability and growth, the need to promote social and civic competences, intercultural dialogue, democratic values, fundamental rights, social inclusion, non-discrimination, active citizenship, critical thinking, and communicative competences through current media.

10.3.3 KEY ACTION 3: DIALOGUE BETWEEN YOUTH AND POLITICIANS

The activities to support policy reform are aimed at achieving the objectives of the European political agendas, specifically the Europe 2020 Strategy, the Strategic Framework for European cooperation in the field of education and training (ET 2020), and the European Strategy for Youth. This action promotes the active participation of young people in democratic life, and encourages debate on the issues and priorities established in the Structured Dialogue and in the renewed political framework on youth ("Structured Dialogue" is the name given to the discussions held between youth and youth policy makers to change policies).

These debates are structured according to priorities and calendars, and include events where young people discuss the issues agreed with policy makers, youth experts, and representatives of public authorities in charge of youth policies. More information on the Structured Dialogue can be found on the European Commission website.

10.3.4 SPECIFIC ACTION: JEAN MONET

The aim of the Jean Monnet actions is to promote excellence in teaching and research in the field of EU studies throughout the world. These actions also seek to boost dialogue between academics and policy makers, especially with the objective of improving global and EU leadership.

Studies on the EU include the study of Europe as a whole, with a special emphasis on integration, attending to both internal and external aspects. They promote European citizenship and address the role of the EU in a globalized world, improving knowledge and facilitating future engagement and dialogue between people worldwide.

10.3.5 SPECIFIC ACTION: SPORTS

Actions in the field of sports are intended to contribute to the development of the European dimension in sports by generating, sharing, and disseminating experiences and knowledge on its various aspects across Europe.

Ultimately, sports projects supported by Erasmus Plus should lead to higher levels of participation in sports, physical activities in general, and volunteering.

10.4 THE ERASMUS PLUS PROGRAMME FOR CHILDHOOD EDUCATION

Erasmus Plus wants to improve the quality of **pre-primary, primary, and secondary education** in schools across Europe. It offers pre-primary teachers **Mobility for Learning** opportunities, with the objective of expanding and improving their professional development, and enabling collaboration with their counterparts from other European countries. Through **Strategic Partnerships**, it supports the exchange of good practices and innovation criteria to address common challenges, especially the processes of inclusion in the classroom and the full development of children from 0 to 6 years of age, fostering links in the after-school environment with other educational and training areas.

WHAT CAN ERASMUS PLUS OFFER TO YOUR SCHOOL

All schools, pre-primary, primary, and secondary schools can join Erasmus Plus. Funding is available for staff mobility projects and transnational associations, as we have pointed out in the previous sections. Furthermore, during the drafting of this project, agreements have already been reached between the European Parliament and the Member States for the new Continuation Program from 2021 to 2027, with a specific budget of more than 26.000 million Euros.

Entire classes or groups of students can visit partner schools, and individual students can spend a longer time in a school in another country. Among the opportunities this offers, we can highlight:

- The development of activities abroad to expand the knowledge and skills of pre-primary teachers.
- Teachers, staff, and students can get to know other European countries.
- Broadening the horizons of the students, raising their aspirations, and increasing their life skills.
- Connecting with other schools across Europe.
- The cooperation between schools to improve their level and quality of teaching.
- Establishing links with companies, policy makers, youth organizations and other partners in your own country and throughout Europe
- Teaching in associated schools.

All these different activities can last from two days to two months, and some of them in special cases can even last for a year.

ONLINE PLATFORMS LINKED TO THE ERASMUS PLUS PROGRAMME

eTwinning

— www.eTwinning.net/es/pub/index.htm—

The Erasmus Plus ***eTwinning*** platform is the largest online community of schools in Europe, with more than 250.000 school workers from schools in all member counties. Through this platform, both teaching and non-teaching staff (managers, advisers, librarians, etc.) are able to connect with other schools to create online activities in which students and employees participate. eTwinning is an excellent way to communicate with other schools and exchange ideas.

Teachers can register and participate in different activities, such as:

- Discussions with other colleagues.
- Online projects from classroom to classroom.
- Online cooperation between members and professional development.
- Development of ideas for Erasmus Plus projects with teachers in other countries.

All the work done in the eTwinning platform is carried out within a secure online environment, and the platform is often used in conjunction with other Erasmus Plus projects to maintain contact with partners.

If you want to check out the available opportunities, just register at www.eTwinning.net.

School Education Gateway

— www.schooleducationgateway.eu/es/pub/index.htm—

School Education Gateway is a single point of access for teachers, experts, policy makers, and other European participants in changing school education, including pre-primary education and care (ECCE), and vocational education and training (VET). This platform is free for all users; schools interested in starting a project in Erasmus Plus will find a lot of useful tools:

- A space for information: with new content every week, including expert opinion articles, news articles, interviews, updated publications, and practice examples.
- A catalogue of resources like recent research reports, teaching materials created in European projects and training courses, and the European Toolkit for Schools, with materials on preventing early school leaving and a self-assessment tool to help you develop your own school actions.
- "Teacher Academy", an opportunity for teacher development that offers free online courses developed by internal experts, webinars, and teaching materials.
- A search tool for partners of strategic partnership and other mobility opportunities.
- An online training course to prepare Erasmus Plus project applications.

Erasmus Plus Project Result Platform

— http://ec.europa.eu/programmes/erasmus-plus/projects—

The Erasmus Plus Project Results Platform is the European Commission's database for the Erasmus Plus Programme: it contains descriptions of all projects funded under the Programme, including the contact information of participating organizations and results of all completed projects, with links to their websites.

It is the perfect place to check what an Erasmus Plus project looks like and what can be achieved with one. The platform contains good practices and success stories, making it ideal for those seeking inspiration for their own project ideas.

You can use the available search criteria on the Platform's website, filtering by Programme, year, country, keyword, etc. to find exactly the type of project you are looking for.

- E+PRP tutorial video

10.5 IDEAS AND OPPORTUNITIES FOR PROJECTS WITH LOW VISION STUDENTS

First of all, we know that Erasmus Plus as a Programme is a useful tool at the European level for promoting inclusion and fighting educational inequalities generated as a result of barriers and obstacles for students with special educational needs (SEN). One of its objectives is to help member countries improve their inclusive policies and practices in the field of education, by supporting projects that contribute to the development of inclusive educational systems to guarantee the right of all students to inclusive and equitable educational opportunities. This also entails another objective: to improve the life chances of students and the possibilities of actively participating in society.

Although the educational policies, practices, and contexts of each country are different, the Programme (in collaboration with the European Agency for the Development of the Education of Students with SEN www.european-agency.org) establishes strategic lines to promote inclusion in the educational field:

- Promoting quality in the field of special needs and inclusive education by maintaining a long-term framework for expanded European collaboration.
- Facilitating the effective exchange of knowledge and experiences among and within member countries.
- Identifying the key factors impeding or supporting progress, and providing countries with information and guidance.
- Analyzing and reviewing the evolution of policies in countries, to support the development of effective and sustainable inclusive education systems.

Among other examples, Erasmus Plus supports innovative projects aimed at:

- Improving the learning of students with disabilities or special needs so they complete educational cycles.
- Facilitating the transition to the labor market to students with disabilities or SEN.
- Improving the access, participation, and performance in education and training (both formal and non-formal).
- Prepare teachers and workers for the challenges they might face related to equity, diversity, and inclusion.

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