PrECIVIM
Promoting Effective Communication for Individuals with a Vision Impairment and Multiple Disabilities

IO3: Training Manual

Training Manual

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Prepared by:	**Babes Bolyai University (BBU):** Andrea HATHAZI (Ed.) Cristina BĂLAȘ-BACONSCHI IoanaLetiția ȘERBAN Marian PĂDURE
Contributors:	All partners
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Training Manual

Training Manual for developing competences of professionals in communication skills of children with visual impairment and multiple disabilities (MDVI)

Erasmus+

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TRAINING MANUAL

Training Manual for developing competences of professionals in communication skills of children with visual impairment and multiple disabilities (MDVI)

Andrea HATHAZI (Ed.)
Cristina BĂLAȘ-BACONSCHI
IoanaLetiția ȘERBAN
Marian PĂDURE

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Multiple Disabilities

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Contributors:

Greece
Adrianos MOUTAVELIS
Charikleia KANARI
Christiana ZOTOU
Dionysia VASILARA
Dimitra ZAFEIRA
Eleutheria TRIKILIDOU
Fotini BOULOUKOU
Lenia AIDONIDOU
Maria PAPAZAFIRI
Maria ZEZA
Vassilis ARGYROPOULOS

Cyprus
Maria KYRIACOU

Romania
Mihaela BUJOR
Oana FRENŢIU
Olimpia Lorelei LUCA
Ramona Ionela MUREŞAN
Ramona Mariana TIMBUŞ

United Kingdom
Anne WEBSTER
Geraldine O'GRADY
Jo FITZSIMONS
Julie COOPER
Leda KAMENOPOULOU
Lorraine BOYSE
Marize LAWSON
Verónica RAMÍREZ-MONTENEGRO

Aims and objectives of the training manual

The aim of the training manual is to become a useful resource for professionals who work with children with visual impairment and multiple disabilities (MDVI) within programs of professional development and in-service training. In this view, professionals will develop competences in:

- understanding the implications of MDVI on development, communication and learning,

- planning adequate and specific interventions,

- building up experience and knowledge, abilities and skills in assessment and implementation of IEP's,

- identifying and using efficiently specific systems and techniques of communication,

- implementing a holistic approach.

The objectives of the training manual are:

- get familiarized with updated literature review

- understand the implications of visual impairment and multiple disabilities on development, communication and learning

- to have a hand-on experience with proposed activities and methodologies

- to develop assessment according to the needs of individuals with visual impairment and multiple disabilities

- to develop and use instructional materials to support the specific needs of individuals with visual impairment and multiple disabilities

- to invite trainees to self-reflective and self-evaluation procedures

Description of how to use the manual

The manual is intended to be used with an interactive approach, being not only a resource for specialists to learn and extend on their knowledge regarding this specific topic, but also with an opportunity to carry out practical activities and exercises that will improve working skills regarding evaluation and intervention. The manual includes examples of best practices and resources from the schools and institutions from the countries involved as members of the consortium of the PrECIVIM Erasmus+ project.

The manual can be used as a syllabus, but also as a training material for professionals in the field.

Introduction

The development of communication skills represents a priority in the education and intervention of children with visual impairment and multiple disabilities (MDVI). Professionals must use person-centered and family-centered approaches, individualizing the assessment and implementation of support programs in the development of communication skills, thus aiming for functionality, participation and independence.

The training manual combines theoretical information with practical examples of case studies, activities, assessment methodologies, intervention programs, provided by specialists from schools and institutions within the countries part of the project consortium.

The training manual invites to self-reflection, but also to constructive group discussions and activities, drawing attention on the roles and responsibilities of professionals regarding specific support for children with MDVI. The training course is addressed to special education teachers, speech and language therapists, occupational therapists, orientation and mobility therapists, support teachers, teaching support staff, itinerary teachers, and teachers. The manual can be used also by parents.

Key concepts

MDVI

A person with at least two disabilities, one of which manifests itself as a visual impairment, which impact significantly on the person's learning potential to such a degree to require a customized educational provision[1].

Augmentative and alternative communication (AAC)

According to ASHA - American Speech-Language-Hearing Association (1993) augmentative/alternative communication systems attempt to compensate and facilitate, temporarily or permanently, for the impairment and disability patterns of individuals with severe expressive and/ or language comprehension disorders. Augmentative and alternative communication (AAC) addresses the needs of individuals with significant and complex communication disorders characterized by impairments in speech-language production and/or comprehension, including spoken and written modes of communication.

Communicative competence

Communicative competence refers to the knowledge of effective and appropriate communication patterns and the ability to use and adapt that knowledge in various contexts (Cooley and Roach, 1984).

Communication disorder is an impairment in the ability to receive, send, process, and comprehend concepts or verbal, nonverbal and graphic symbol systems (ASHA, 1993).

Expressive communication refers to the way in which someone conveys thoughts. Methods of expressive communication include speaking, signing, gesturing, pointing or crying. (NCDB, 2010 revised)[2].

Receptive communication refers to the way in which someone interprets or understands a sender's communication message. Listening and reading are examples of receptive communication.

Pre-symbolic or non-symbolic communication refers to communication that does not use symbols such as words or signs. This kind of communication, therefore, does not have a shared meaning for others. Infants use pre-symbolic communication when they cry, laugh, reach, or point as a way of communicating their thought, and the receiver must attribute the

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[1] MDVI Euronet - www.mdvi-euronet.org/site/areas-of-work-and-interest.php
[2] Online at http://documents.nationaldb.org./products/Expressive.pdf

meaning of their messages. For example, babies may cry when they are hungry or reach for a toy when they want to hold it.

Symbolic communication refers to communication that involves a shared message between the sender and the receiver. Examples of symbolic communication include speech, sign language, writing (print or braille), picture communication systems, and tactile communication systems.

Pragmatic language (PL) refers to the appropriate and effective use of language in interpersonal contexts and is of central importance for children's ability to function well at home, school and with their peers (Russell, 2007, Russell and Grizzle, 2008 cited by Green et al., 2014). It can be distinguished from the structural aspects of language that have been traditionally considered relatively independent of context: phonology, syntax and semantics (Camarata and Gibson 1999). Difficulties in PL can be seen in various behaviors, such as talking too much, poor turn-taking in conversation, failure to adapt a message to the needs of a listener, failure to respond to verbal cues from others, over-use of stereotyped phrases, and difficulty understanding sarcasm, jokes and metaphors (Bignell and Cain 2007, Camarata and Gibson 1999, Perkins 2010, Russell 2007).

Functional communication

Alvares and Sternberg (1994) define functional communication as being interactive, facilitator of following events, efficiently used in familiar contexts and interactions, modality of obtaining material and social results and reaching advanced efficient and effective communication. „*Functional communication skills* are forms of behavior that express needs, wants, feelings and preferences that others can understand. When individuals learn functional communication skills, they are able to express themselves without resorting to challenging behavior or experiencing communication breakdown".[3]

Total communication is a philosophy requiring the incorporation of appropriate aural, manual and oral modes of communication to ensure effective communication with and among hearing impaired persons (The Conference of Executives of American Schools for the Deaf, 1976)

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[3] www.asha.org/NJC/Definition-of-Communication-and-Appropriate-Targets

Theoretical framework and Holistic Approach used in the development of Communication Skills

The development and use of communication skills by children with MDVI is influenced by a series of factors that need to be approached.
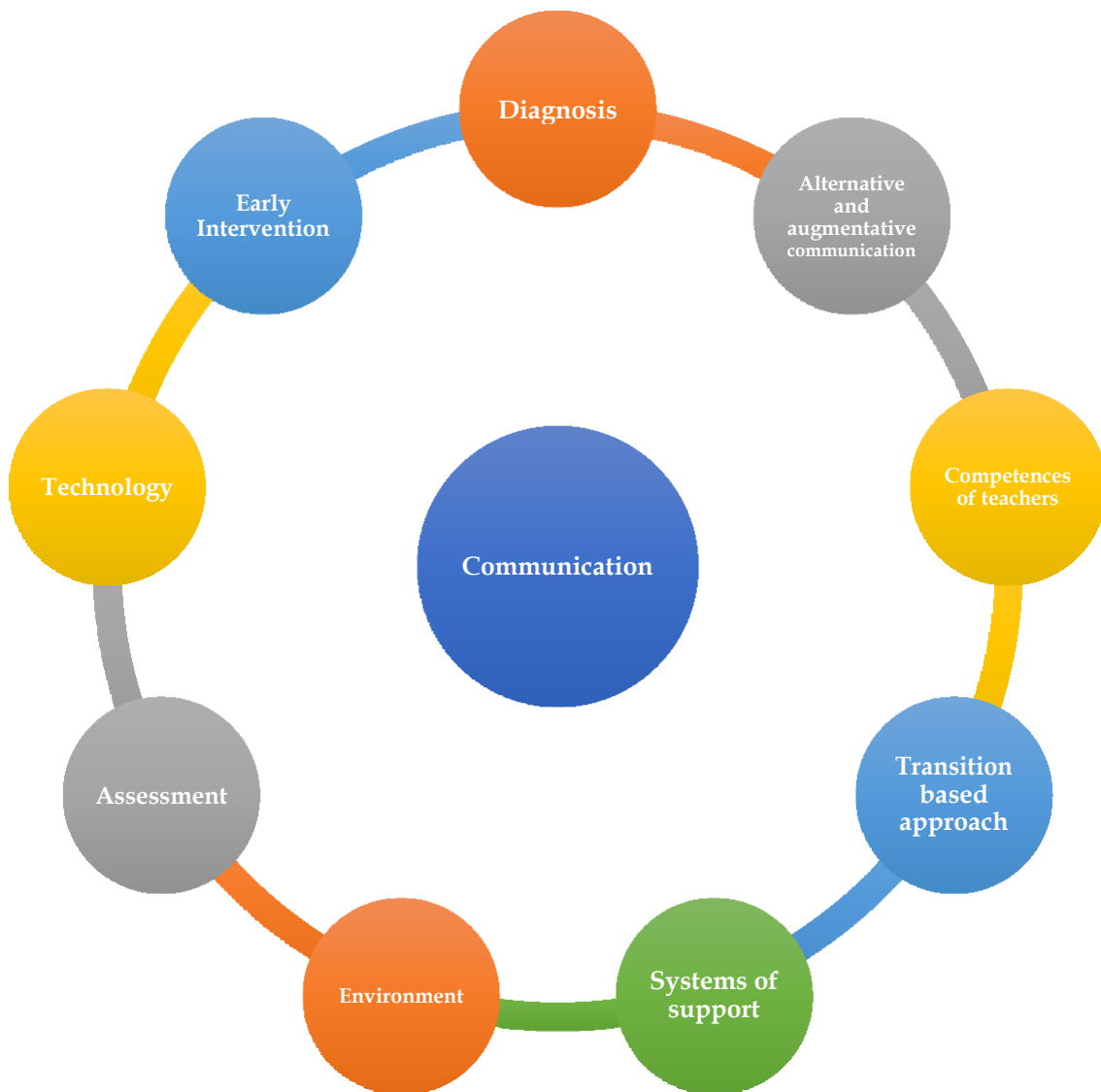
Modules

I. Conceptual Framework of development and characteristics people with visual impairment and multiple disabilities (MDVI)

II. Assessment of communication

III. Specific interventions in the development of communication skills

Module I

Conceptual Framework of development and characteristics of people with visual impairment and multiple disabilities

I.1. Defining visual impairment and multiple disabilities (MDVI)

„A person with at least two disabilities, one of which manifests itself as a visual impairment, which impact significantly on the person's learning potential to such a degree to require a customized educational provision."[4]

The following terminology can be identified in the category of visual impairment and multiple disabilities (MDVI), according to different authors and approaches (Aitken et al., 2000):

- MDVI   multiple disabilities and visual impairment
- PMLD   profound and multiple learning disability
- CLDD   complex learning difficulties and disabilities
- SLD   severe learning difficulty and disability
- DB   deaf blindness
- MSI   multisensory impairment

The diversity within the terminology expresses the heterogeneity of the category, but the common aspect that needs to be understood and interpreted is the combination of at least two disabilities which will determine a unique pattern of development. Consideration should be addressed to identify the individual developmental needs of children and the specific programs and support they must benefit.

I.2. Typology of disabilities in the population with MDVI

In addition to blindness or visual impairment, **a child may have additional disabilities, such as cognitive, developmental, hearing, or mobility impairments**[5].

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[4] MDVI Euronet - www.mdvi-euronet.org/site/areas-of-work-and-interest.php
[5] http://www.perkinselearning.org/scout/topics/multiple-disabilities

Module I

In the group of people with multiple sensory impairments, people with visual impairments **present simultaneously one or more of the following conditions**, determining a combined effect on the level of communication, mobility and performance in solving the tasks of every day, to a single child.

These **conditions** are (Akhil, 2000):

- Different degrees of learning difficulties
- Cognitive delay
- Cerebral palsy
- Autism
- Different degrees of hearing impairment
- Physical disabilities including paralysis or delays in motor development
- Emotional disorders
- Neurological disabilities
- Language disorders
- Epilepsy

According to Rawal and Thawani (2003), in the **category of children with multiple sensory disabilities comes**:

- Deafness: visual impairment + hearing impairment
- Visual impairment + Hearing impairment + learning disabilities
- Visual impairment + learning disabilities
- Cerebral palsy + Learning disabilities / Speech difficulties / Hearing / visual impairments

Ek (2010, citing by de Verdier, Fernell, & Ek, 2018) state that **autism is the most commonly reported coexisting developmental disorder in children with blindness**.

Blindness has a significant impact on a child's development and learning, and if the child has additional disabilities the situation is even more challenging. The authors **emphasize the complex needs** of children with blindness and Autistic Spectrum Disorder with and without Intellectual Disability, needs that are to be interpreted and met (de Verdier, Fernell and Ek, 2018).

Salleh and Ali (2010) citing Erin and Koenig (1997) state that **learning disabilities are often not identified and approached in intervention programs** for students with visual impairments due to the following aspects:

1. Visual impairments are identified early in life, but there is a delay in identifying learning disabilities, that become more visible within educational tasks in the elementary grades.

2. Learning disabilities can be seen only as an implication of the deficitary visual functioning.

3. Visual impairment is diagnosed easier than learning disabilities.

4. Atypical development in learning disability can be neglected in approaches.

5. Limited performances are assigned to low vision functioning and implications and not to learning disabilities.

Remember

The combinations and the complexity of the disabilities within visual impairment and multiple disabilities can vary from child to child.

Each child presents a unique pattern of development. Do not make assumptions! Always take into consideration all the factors that might influence the child's development.

Exercise

List the needs in development and learning for the children with visual impairment and multiple disabilities who are in your classroom/group/unit.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

I.3. Characteristics of people with visual impairment and multiple disabilities (MDVI) and implications for development

Sacks (1998) identifies the following **characteristics of children with visual impairments and additional disabilities:**

1. Difficulties in transferring skills to new contexts and lack of generalization of skills;

2. Concrete versus abstract learning, which means that learning of abstract concepts is limited due to lack of opportunities for imitation and direct observation and there is a need for increased hands- on, direct experiences and routines.

3. Limited attention span and increased distractibility.

Raynolds and Fletches – Janzen (2000) describe **people with multiple disabilities as presenting two or more disabilities that determine limited functional experiences**.

Salleh and Ali (2010) state that the existence of more than one disability may results in children with additional disabilities **having difficulty to access to the national curriculum and that the additional disabilities may determine behavioral problems which are caused by differences in the learning patterns.**

Rogow (2005) highlights the **implications of multiple disabilities in intervention and education**, implications that are challenging for the educational systems. To provide educational opportunities for these children, some aspects need to be considered:

– The need to have adequate educational policies for children with multiple disabilities. About adequate systems, education for children with multiple disabilities should include access to an appropriate and functional curriculum that takes into account the development profile of these children and their characteristics, including strategies and methods that are specific, from co-creative, one-to-one intervention, routines and reinforcements, materials that are

motivating, small number of children in a group, competencies of the professionals. **A successful intervention cannot be achieved in any type of environment or educational system**. **It must be organized, structured and realized according to the specificity of the disability.**

– Development of educational programs and individualized intervention plans based on an adequate, continuous, functional evaluation, using the results of the evaluation in the form of strategies, formulation of objectives and content setting.

– The inclusion of appropriate components with functional objectives with a focus on independence and the development of functional vocational skills.

– Facilitating inclusion, with effects on social skills and a positive attitude, having an effect on children's self-esteem.

– Continuous development of teachers' skills, regarding knowledge and practical skills of intervention.

– Creating a reactive and responsive environment with opportunities for interaction, communication, learning, functional behaviors, active participation of children.

McInnes and Treffry (1982, pp. 4-5) evidentiate both the **abilities and the limitations** that children with multiple sensory disabilities present:

– limited communication abilities;

– distorted perception of the environment;

– limited capacity for anticipation of events and the results of activities;

– lack of basic extrinsic motivation;

– medical conditions that determine delays in development.

Akhil (2000) highlighted **common characteristics** of children with multiple sensory impairments:

– Child development is affected in all areas of development;

- The most affected area in the case of children with multiple sensory impairments is communicating with people around and interpreting the stimuli in the environment;

- Opportunities to interact with the environment are very limited;

- The ability to move and use objects from the environment is restricted;

- The need for constant support in basic day-to-day activities

- The need for a highly structured program, regular routines, permanent consolidation of acquired skills.

Children with multiple sensory impairments including visual impairment present developmental delays and learning difficulties in all areas and levels of functioning (cognitive, visual, communication and language, general and fine motor skills, social-emotional).

Heward (1996) highlights characteristics of children with multiple disabilities:

- slow rhythm in acquiring new knowledge and abilities, the need to repeat them in the same instructional context, especially when there is a lack of continuous exercising and opportunities for generalization and practice;

- difficulties in generalizing and maintaining new knowledge and abilities;

- reduced expressive and receptive communication skills, so that alternative and augmentative systems of communication are necessary to improve access to educational contexts and social interactions;

- reduced motor skills and mobility, which determine reduced possibility to active participation, exploring the environment, initiating interactions;

- difficult and challenging behaviors, such as tantrums, self-aggression, aggression;

- reduced daily living skills.

Module I

Children with MDVI can benefit from a *total communication* environment, where a variety of means of communication is available to them. With perseverance, understanding can be developed and the communication of basic wants and needs can be established through a variety of channels.

Since the visual system is complex and the causes and effects of visual impairments are numerous and intricate (Holte et al., 2006), children with visual impairments form part of a heterogeneous population. Approximately 70% of children with visual impairments present with multiple disabilities (Chen, 2001 cited by Mosca et al, 2015), and there are more than 80 known genetic and chromosomal syndromes that may result in deaf-blindness (Holte et al., 2006). Some misinterpretations of the diagnosis can also occur, as for example, the social communication difficulties of children with visual interpretations may be mislabeled as autistic tendencies.

Visual impairment may affect the play, motor, cognitive, social and communication skills of young children (Chen, 2001). Developmental difficulties of young children with visual impairments and the nature of the development of the visual system suggest the need for intervention within the first 12 months of life (Davidson & Harrison, 2000). Increased information about language and communication development in young children with visual impairments may improve early identification of communication difficulties, assist in goal setting and draw attention to the need for early communication intervention for this population.

I.4. Development of communication in the context of visual impairment and multiple disabilities

Definition. The process of communication refers to social interaction, conversation, pragmatics, language act, dialogue, intersubjectivity, co-building of the direction, mutual understanding (Brassac, 1994).

Development of communication must be approached within natural and functional contexts, creating a responsive communication environment, understanding that it is a natural and dynamic process, but sequential.

Creating opportunities, implementing routines, use of natural contexts and adequate learning environments facilitate participation and development.

Implications of visual impairment and multiple disabilities in communication.

Characteristics and factors that determine limited communication opportunities for children with multiple disabilities:

- The severe sensory loss that may be present prevents awareness of the partner and the communication situation.

- Motor difficulties have implications on spontaneous communication, on natural modes of expression, even if there is no difficulty at the reception level.

- Delays in cognitive development that interfere with learning, memory and understanding needed for conventional communication;

- Previous unsuccessful experiences of communication can lead to a low motivation to engage in communication situations and participation of the child is more passive (Rowland & Schweigert, 2002).

For children with a vision impairment and multiple disabilities (MDVI), the path to effective communication can be very long and difficult to negotiate. The outcomes rely on the quality of the interactions of their caregivers, their environment and the opportunities that they are given.

Exercise

Objectives:
- – to reflect on the development of the child,
- – to identify strengths, needs and challenges

Time
- – 20 minutes

Method
- – identify a child with MDVI and list his or her communication needs

Questions
- – Was the information about the child easy to identify?
- – What is in your opinion the main purpose of the exercise?

I.5. Development of communication

The model of development of communication (Rowland, Stremel-Campbell, 1987; Rowland and Schweigert, 2000) proposes seven levels of communicative competence with implications on the assessment and development of communication skills.

The seven levels of communicative competence are:

Pre-Intentional Behavior

Intentional Behavior (not intentionally communicative)

Nonconventional Presymbolic Communication

Conventional Presymbolic Communication

Concrete Symbolic Communication

Abstract Symbolic Communication

Formal Symbolic Communication
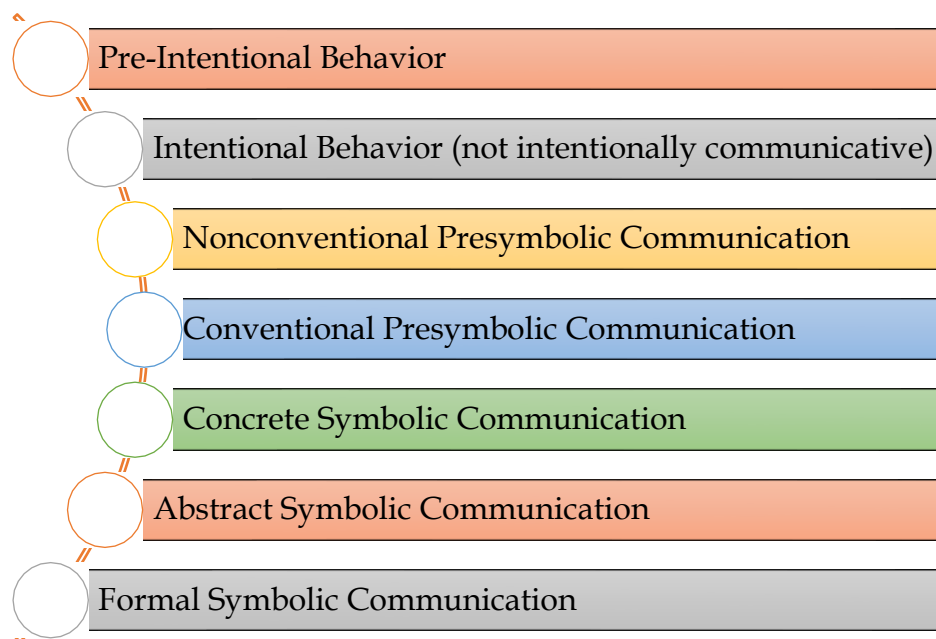
Pre-Intentional Behavior is a reflexive or reactive behavior that is not voluntarily controlled by the child, the behavior being interpreted by adults, who assign meaning, followed by the child's response confirming the signification that was assigned. The behaviors that are performed reflect the state of pleasure, discomfort, hunger, thirst, protest and demand that are expressed through body movements, facial expressions, crying, sounds, visual contact. At this level, any behavior that involves a change from the previous state and that can be differentiated has an adult signaling value (Coupe O'Kane, Goldbart, 1998).

The development and use of communication skills takes place when there is a reliable communication partner that provides access to a reactive environment and facilitates communication with others (Alsop, Blaha & Kloos, 2002).

Module I

Transition to intentional behavior

One of the most important aspect in the development of communication is INTENT and communication of child must become INTENTIONAL

Shared attention and mutual action allow the child to anticipate events and initiate interactions with a direct effect on the development of communication. The child is more responsive and can easily extract meanings from the adult voice patterns, facial expressions and actions, "reading" the signals and behavioral expressions of others.

Bates (1976) argues that the intent of communication derives from:

1. The context in which the intended purpose of the child in the direction of which the child acts is indicated.
2. Making a movement or producing a sound where the visual contact alternates between the object and the adult;
3. Persistence of behavior until the goal is reached;
4. Behavior that confirms that the objective reached was that desired by the child.

The three major pragmatic functions used for intentional communication in the prelinguistic period are initiating joint attention, requesting, and turn taking (Wetherby, Cain, Yonclas & Walker, 1988; Wetherby & Prutting,1984; Yoder & Stone, 2006).

Intentional Behavior is the stage where the child is aware that the use of a certain form of communication is a response from the environment. The child has intentional motor behavior but still does not attempt to deliberately communicate to another person. The child has voluntary control over many behaviors but is still unaware of the communicative aspect of these behaviors. However, some behaviors have this function of communication, adults are also those who attribute them meaning.

Behaviors such as the extent of people or objects, planking, hitting objects can mean the desire to get objects, to deny certain actions, to attract attention, adults also confirm their own behavior by signifying these initiatives by the child.

Bruner (1983) proposes three forms of early intentional communication:

1. initiation to regulate behavior,
2. initiation for social interaction,
3. initiation for shared attention.

These are intentions of communication being actions directed both on the person and on the objects (Coupe O'Kane & Goldbart, 1998). At this stage, emphasis is placed on providing answers and reinforcements to confirm the child's communication behavior and encouraging him / her to resume the behavior, aware of the change he / she can make on the environment in informational, communicative and attitude. Without this confirmation, the child stops producing these behaviors.

Intentional communication involves conveying a message to another person by either

(a) the use of gestures, vocalizations, and eye gaze combined with coordinated attention to an object and a person; or

(b) the use of conventional gestures (e.g., distal points) or symbols (e.g., spoken words or sign language) (Yoder, McCathren, Warren & Watson, 2001)

Nonconventional presymbolic communication is the stage in which the child becomes aware of the effects of behavior on another person and starts using nonconventional forms of communication to intentionally communicate a limited amount of message, and the consequences of these behaviors are obvious, received and interpreted by the adult. Children at this stage of communication use movement, visual contact, touch, indication, vocalization and certain gestures to convey the message usually in an immediate context.

At this stage for dealing with conventional gestures, the imitation can be learned through the following steps:

1. Co-activity: characterized by common actions of the teacher and the child where the role of the teacher is to firmly guide his movements.
2. Cooperation: The role of the teacher in conducting the action decreases considerably.
3. Reaction: the child continues with greater or lesser independence the movements he started with the adult;

    4. Copying: The child can complete the movement that has been demonstrated.

Conventional presymbolic communication. The child operates on the environment in a much more elaborate manner. Similarly, communication becomes conventional and decontextualized, more accurate and easier to interpret by the adult.

The predominant forms of communication at this level are gestures, vocalizations, verbs. Gestures, acts and actions that do not involve direct contact with objects or people are very common. The child nods or negatively, handles, stretches his hand with open palms, shows objects, offers objects, shows with his finger. Gestures can also be created by mimicking a motor act by the child. The child uses the objects in a way that reflects the knowledge of the utility of the objects, and the specific meanings correspond to established and existing conventions in the child's culture and environment.

Communication studies in children with severe, severe and deficient children reveal that the acquisition of a natural gesture repertoire is not a basis for the acquisition of symbolic communication. Most multiple disabilities children who have acquired gesture communication skills do not pass the communication stage through abstract symbols (Rowland & Schweigert, 1989).

Concrete symbolic communication is the stage in which the child associate's concrete symbolic representations with specific environmental references, acquiring the concept of correspondence one to no between the symbol and his referent, which he represents. Many children are working here and now, it is difficult to decontextualize the immediate and concrete environment.

Children's communication allows children to refer to entities physically and temporally spaced. Symbols are used at this stage, and symbols are created by associating them with already known objects or concrete situations, so the environment, the variety of opportunities, the child's access to various stimuli and contexts is very important, because exploration is the first level of knowledge. Without an initial exposure and knowledge of the environment by the child, the representations were difficult, and the concepts were deficient.

Abstract symbolic communication

At this stage the child uses a limited number of abstract symbols to communicate. For many children, these abstract symbols are words spoken or written. For children with hearing impairment, signs language takes up this function. It is important to develop basic vocabulary, both words and signs, used in everyday life and of interest to the child. They become functional when the child uses them in different contexts with intent to get a response from the communication partner.

Formal symbolic communication

At this stage the child acquires and uses rules corresponding to a formal language, in which there is a combination of single symbols in the previous stage referring to syntactic and pragmatic aspects.

The Communication Matrix is a communication skills assessment that was first published in 1990 and revised in 1996 and 2004 (Rowland, 2012).

An online[6] version of the Matrix was developed in 2003 to support the use of the instrument by professionals. The online assessment tool makes the Matrix easier to use, it is available for potential users for free; to encourage collaboration between professionals and parents; and to create a database of information that would advance scientific knowledge about communication development in persons with complex communication needs (Rowland, 2012). The Communication Matrix determines a better understanding of the development of communication and the unique needs and abilities of the development in early stages.

REMEMBER

Have in mind that it is not necessary just to transform communication to more sophisticated forms of communication, but it is important to identify the existing form of communication, the function that it has and the output for the child. The child needs to be exposed to all forms of communication and behaviors.

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[6] Online at www.communicationmatrix.org

I.6. Assessment and reflections

Use the Communication Matrix online assessment instrument and identify the level of development of communication for a child with visual impairment and multiple disabilities from your class/group/unit.

Describe the characteristics of communication in the context of visual impairment and multiple disabilities and the implications on the communication environment.

Identify the competences of professionals that are needed to support the communication needs of a child with visual impairment and multiple disabilities.

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Module

Assessment of communication

II
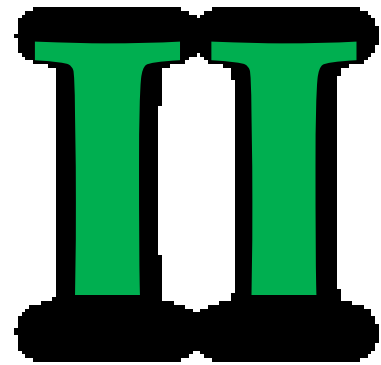
Definition: Evaluation is the process by which information is obtained about the level of development of the child and the characteristics of development in different areas (Aitken, 1995). The process of evaluation allows the multidisciplinary team to develop specific intervention programs and approaches that support the needs of the child and improve overall performance in educational and functional context.

The purpose of the evaluation (Bryson, 1993)

- to learn new information about the child,
- to assess the various aspects of development,
- to provide information that can be used in the educational and rehabilitation processes,
- to identify priorities in intervention.

Eyre (2000) considers that the evaluation is to obtain as much information as possible on the identification and monitoring of progress, management of a specific problem, ways of educational planning. Aitken (1995) considers that it is important to set the basic level of development as a starting point in intervention, to monitor all changes, to structure the intervention stages and to set curriculum and learning objectives. Assessment is the process of collecting and interpreting information to make informed decisions (Lewis & Russo, 2000). An efficient and accurate assessment will determine a focused-on needs intervention. An assessment that does not make any progress in the performance of the child and does not allow identification of the content to be included in the educational and intervention programs is not useful (Lewis, Russo, 2000; Siegel-Causey, 1996).

II.1. Goals and objectives of assessment

1. Development of a comprehensive protocol for assessing communication and socio-emotional skills. Evaluators will use an approach that will allow them to analyze and understand the complexity of communication behaviors as an integrated part of the psycho-educational assessment aimed at assessing the cognitive, social, behavioral, educational and adaptive level.

2. Develop and implement an evaluation approach that allows taking decisions on relevant goals and objectives of the assessment, selection of assessment tools and the implementation of specific strategies. Practitioners will report their observations to the specific needs of children with visual impairment and multiple disabilities. The group of individuals with visual impairment and multiple disabilities are an extremely heterogeneous category in terms of sensory abilities, cognitive abilities, motor skills, learning and communication skills, interests, opportunities and learning experiences.

It is important for the evaluator to identify the approach or approaches that best address the main concerns.

The approaches that can be used are standardized assessment, development assessment, curriculum evaluation, functional (ecological) and behavioral assessment.

Evaluators will rely on their experiences and their own training in developing the evaluation process, integrating knowledge and good practice into the interpretation of the results.

3. Development of a protocol that facilitates for practitioners the assessment of the dynamic role of environmental and inter-contextual factors of individual skills and behaviors, either in special or inclusive schools, day centers, resource centers, distance learning or home education.

The evaluation of skills must be related to contexts.

The abilities of professionals to assess environmental factors and describe abilities are essential in psychoeducational assessment.

4. Underline the importance of inter- and multidisciplinary in evaluation, with the ability to reflect and integrate their own assessments into the child's development profile.

The risks of not approaching needs that were not identified through assessment is high in children with visual impairment and additional disabilities.

The purposes of assessment are (Lewis, Russo, 2000):

- Screening,
- Determining eligibility for educational and rehabilitation programs,
- Instructional planning and placement,
- Progress evaluation .

Aspects to be considered

- Screening for additional disabilities and difficulties in the context of visual impairment.
- Screening for visual impairment in the context of severe learning disabilities, physical impairments.
- Assessment of educational needs and the effect of the visual impairment on development and learning.

IDEA (1997) states (apud Lewis, Russo, 2002) that the child needs to be "*assess in all areas related to the suspected disability, including, if appropriate, health, vision, hearing, social and emotional skills, intelligence, academic performance, communication, motor abilities*" (IDEA, 1997, sec 614 [b] 3c).

Salvia and Ysseldyke (1995, cited by Lewis and Russo, 2002) suggested three questions to be answered when preparing for an assessment:

1. **What does the students need to be taught?**
2. **How does the student learn?**
3. **What is expected as educational achievements?**

Exercise: Think of a student with MDVI from your classroom/unit/group. Answer to the questions mentioned above.

_____

_____

_____

_____

_____

_____

Module II

Remember

1. All children present communication.
2. Many children communicate, but their communication is not recognized as such.
3. Adults should be competent listeners and focus on what the child already masters as a skill, determine accessible and functional skills as forms of communication, identify any expression of the intent to communicate.
4. Communication is a continuous and dynamic process.
5. Parents can provide valuable information regarding the child's communication. This information can refer to the way the child communicates and interacts with parents or others, the interests of the child and how to meet them, problematic behaviors, daily routines.
6. No assumptions should be made

Due to the challenges of assessment within the MDVI population and in order to design an appropriate and individualized educational plan, the standard procedure is:

–   Detailed parent/ caregiver intake, obtaining information from the child's medical records to information concerning his/ her daily routine.
–   Clinical observation, preferably an initial in-house observation.
–   Initial assessment by the center's therapists (occupational therapist, physical therapist, speech therapist).
–   Observation in the "classroom": a semi-structured educational assessment tool based on the assessment tools. This observation tool has been designed to meet the needs of recording observations in an organized and more evident manner.

Considerations to be taken during assessment

–   an initial interaction based on trust should be established;
–   the child should feel comfortable in the environment, while interacting with the professionals;
–   time should be given to initiate communication, the child must be aware, perceive, interpret, develop an answer and initiate interaction;
–   attention is given to body language, gestures, movements, the expressiveness of the face and body should be emphasized;
–   the message should be short and clear;
–   activities and actions need to be described to the child verbalized: ex. "Now we go down the stairs", "wash you on the face" etc.;

– assessment of communication must be fun too: use songs, stories, word games, different accents, various rhythms, whispers;
– the child's communication always will be confirmed and reinforced.

Therefore, first and foremost we aim to:

– Establish a relationship.
– Observe the pupils' reactions and responses to stimuli.
– Give meaning and share this information with him/her.
– Utilize the context of environment and opportunities arising from it.
– Use simple and clear vocabulary. Use the senses to offer experience and help the pupil make a connection to the context.
– Guide the pupil through every object of reference or concept using simple language.
– Promote active (if possible) touch or incorporate passive touch to assist the learning process, with respect to the persons' sensory issues – if there are any.
– Provide adequate input so that the pupil can understand the context of everyday vocabulary.
– Utilize every opportunity to improve the use of speech to express needs. Encourage expressive communication through modified intervention.
– Offer choices in daily activities in a structured environment/ in a natural setting.
– Allow the pupil adequate time to respond. Give meaning to any vocalization if the pupil has no speech.
– Promote functional dialogues (in case of verbal pupils) and ability to interact in a structured setting/ in a natural setting.
– Improve cognitive, emotional and social skills by offering constant conditions in a structured setting/ in a natural setting (object permanence, cause and effect, improve short- and long-term memory, recall events, make associations, get in touch with one's emotions and the effect on others).
– Promote socially accepted behaviors.

II.2. Types of assessment

The assessment of specific communication abilities of children with visual impairment and multiple disabilities needs to be planned and realized within a transdisciplinary approach, including information from all members of the team of professionals (Rowland, Schweigert and Prickett, 1995). Professionals in visual impairment are required to participate in the assessment process, and assessment must utilize a variety of types of measures, both formal and informal, to evaluate development, educational achievement, and access to the general curriculum (IDEA, 2004; Olmstead, 2005; Pugh & Erin, 1999 cited by Bruce, Luckner, Ferrell, 2018). General assessment considerations for children and youth with visual impairments refer to age of identification, the family and student's first language, history of educational services, and the presence of an additional disability. (Bruce, Luckner, Ferrell, 2018).

The assessment needs to be tailored to the individual needs, the environment, but also the specificity of interaction between the individual and his or her environment.

II.2.1. Standardized assessment

Standardized instruments require precise administration procedures which can reduce flexibility in the accommodation of the needs of children during the assessment process and the use of norm-referenced testing alone is insufficient to capture abilities of children with visual impairment and multiple disabilities (Bruce, Luckner, Ferrell, 2018). It is necessary to address the issue of adapting tests regarding the administration and the interpretation of results. The true potential of the child can be underestimated or overstated. About the adaptations that can be made, they refer to the use of materials with concrete, visual and tactile support, additional time for solving items, removing items, accepting answers from the child that are specific to his or her way of communicating.

II.2.2. Developmental assessment

Developmental assessment addresses the areas of development, the skills that emerge during development, as well as the identification of the development milestones. It focuses on the quality of the child's interaction with objects and people from his or her environment.

The multimodal screening is both developmentally and criterion referenced and focuses on the axes of:

– Communication (receptive, expressive in various modes -oral, tactile, manual, visual- and levels - prelinguistic and linguistic or verbal and non-verbal),
– Cognitive development,
– Visual perception,
– Auditory perception,
– Tactile perception,
– Social-emotional development,
– Daily living skills,
– Orientation and Mobility,
– Daily living skills.

II.2.3. The educational assessment

The educational assessment records elements from all areas of assessment: vision and hearing degree, hearing and vision function and acuity, multiple disabilities, health condition, fine and gross motor abilities, communications skills, psychological development (developmental, and behavioral), functional and basic academic skills, functional living skills, orientation and mobility and vocational skills. Teachers of students with visual impairments need the knowledge and skills to develop informal assessments including curriculum-based assessments (Bruce, Luckner & Ferrell, 2018).

II.2.4. Functional or ecological assessment

Functional evaluation is the process by which information is obtained to optimize the effectiveness and outcomes of behavioral support plans. Functional evaluation is used to bring clarity and understanding to situations that can be confusing and chaotic (O'Neill, Vaughn, 1998). Systematic assessment can lead to the identification of factors influencing the repertoire of adaptive behaviors, but also problematic issues, which can be the trigger factors for these behaviors, namely the consequences and the finality of these behaviors.

Functional assessment focuses on the skills needed for the individuals to access and participate in the environment in which they operate and learn. The ecological aspect of the functional assessment refers to the fit between environmental requirements and personal needs, experiences, and abilities (McDonnell, Hardman, McDonnell and Kiefer-O'Donnell, 1995). The environmental inventory analyzes the general environment in which the child functions, identifying specific abilities, but also those to be appropriated and developed. Organizing an environmental inventory involves identifying curricular areas, identifying current and future areas, identifying subdomains, identifying activities within each sub-domain, and identifying the skills needed to participate in the activity.
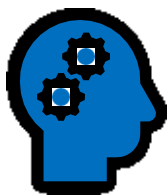
All behaviors have a function. There are behaviors of children that usually are not considered as having a function of communication (silence, being still, stopping activity, aggression).

Teachers should identify the communicative functions of these behaviors and they should not make assumptions without confirming the real intent and function. For example, usually when the child is pointing to an object, we assume that he or she wants that object, but it may not be a request, it could be a comment (It is a toy/object, I played with that object) or a protest (I do not want that object). Heller et al. (1995), state that in this situation, there is a need to introduce and use additional aided or unaided vocabulary to clarify the function, i.e. Want toy, like toy, do not want toy.

Function refers to the intent of the communication and the modifications that the child wants to achieve in his or her environment.

The results that can be obtained in a functional evaluation refer to:

– Clear description of problematic and atypical communication behaviors.
– Identification of events, moments and situations that precede the atypical and atypical behavior that will or may not appear in the ruins.
– Identification of functions and consequences that maintain these behaviors.
– Development of hypotheses describing specific behaviors, the typical situation in which they manifest themselves, the results and reinforcements that maintain this situation.
– Obtaining information by direct observation to support hypotheses, since people who are in the immediate vicinity and in direct contact with the child, do not always observe with accuracy and detachment what happens situations.

Regarding the functional evaluation strategies, there are three categories of strategies:

– obtaining information from relevant persons,
– systematic direct observation,
– functional analysis.

Functional assessment methods include indirect approaches, such as the use of interviews and questionnaires on relevant information, direct and systematic observation of behavior in ordinary environments, and functional analysis.

Functional analysis involves establishing intentional changes at specific and consistent past factors, followed by systematic information collection to determine the effects of these changes on behaviors. The terms functional evaluation and functional analysis do not overlap.

II.3. Observation- assessment tool

Observation involves the identification of significant behaviors, generating functional and essential information about the child. Observation must have a clear and precise purpose. The child will be noticed in the environment where there are opportunities for communication and social interaction

The results of the observation must be separated from the interpretation of observed behaviors.

Through observation you will get information about:
  – the child's skills,
  – progress, stagnation or regression in a certain area of development,
  – the skills that are best learned by the child,
  – the skills that are most difficultly learned by the child,
  – likes and dislikes.

The most objective information will be based on:
  a) what has been observed and noted
  b) confirmation by parents or other team members
  c) contextualization, i.e. whether the behavior is typical for the child or just specific in certain situations
  d) clarity and precision of the observations.

The observation has three main functions (Clarke, 1990)**:**
  1) Support professionals to select appropriate learning experiences;
  2) Communicate with others (parents, specialists and child) about expectations;
  3) Provide parents and specialists with information for assessing progress

II.4. Initial observation within the assessment of communication

It is very important that through direct observation, professionals collect information about the communication skills of children with MDVI while communicating and interacting with the child and his/her family. The evaluators will observe the following communication behaviors and patterns of interaction:

- Modality of exploring the environment;
- Communication systems and modes used in the process of communication between the child and parents, between the child and his/her siblings;
- Type of support given by parents for the communication of the child;
- Initiatives of the child;
- Modalities for asking/ refusing/ negotiating/ ending interaction/ communication/activity;
- Stimuli/toys/objects that the child is interested in and communicates about;
- Length of time the child is involved in interaction;
- Length of time the child is involved in activity without prompting;
- Length of time the child is involved in activity with prompting (name the type of prompting that is used).

The expressing reasons for communication are (Alsop, 2002):

- Protest
- Offering
- Attention choice
- Requesting more
- Greeting
- Asking
- Replying
- Commenting

Module II

Exercise
Observe the child and identify communicative behaviors to support modalities of expressing the above-mentioned reasons.

Protest   _____

                   _____

Offering   _____

                   _____

Attention choice   _____

                   _____

Requesting more   _____

                   _____

Greeting   _____

                   _____

Asking   _____

                   _____

Replying   _____

                   _____

Commenting   _____

                   _____

48

II.5. Inventory on the student's repertoire.

Making this type of assessment involves:
1. listing abilities presented by a child without a disability for a certain activity;
2. observing and noting the level of performance in a child with multiple deficiencies;
3. performing a comparative analysis of the two performances;
4. identifying the necessary changes and adaptations.

Another way to achieve this inventory is proposed by Downing and Demchak (1996).
1. Getting information about what the child can do, like and want to do.
2. Observation of a child of the same age during the activity.
3. Observing the child with multiple deficiencies and determining the abilities that he or she has, but also those that are impaired or even absent.
4. Proposing possible causes.
5. Develop individualized intervention plans with the information obtained.
6. Implementation using natural indices and curricular adaptations.

Information obtained through evaluation will facilitate answers to the following questions:
1. **What are the intervention steps that will improve communication across multiple communication contexts?**
2. **To what extent previous interventions have made significant progress.**

The main assessment strategies focus on:

1. **Informal assessment**

    The informal assessment may provide the educational team with the most accurate information referred to various developmental areas. Deafblind students' abilities and performance are observed,

recorded and assessed in natural environment through informal assessment

2. **Methods of Communication**

Based on the assessed student's communication skills, the appropriate method of receptive and expressive communication is chosen, including tactile cues, tactile sign language, object of reference, pictograms, oral speech, braille

3. **Transdisciplinary team**

The transdisciplinary team consists of primary teacher, psychologist, occupational therapist, physiotherapist, speech, therapist, social service. The Transdisciplinary. Team participates in the planning and application of the educational plan and the family support

4. **Cooperation with parents**

5. **Educational strategies and adaptive educational material**

The educational activities are designed under the prism of multi-sensory approach and experiential learning. The learning approach focuses on the promotion of multi-sensory learning, where visual, auditory, olfactory and tactual stimuli are evaluated and screened.

6. **Environmental adaptation**

The classroom and school environment are enriched with sensory cues (visual, auditory, tactile) to promote students' anticipation, perception, orientation and autonomy.

7. **Individual educational plan**

The transdisciplinary team composes the mdvi and deafblind students' individual educational plan based on the student's assessed educational needs. Deafblind students have unique educational needs in terms of communication, cognitive development, perceptual development, sensory training, social and emotional development, orientation and mobility, daily living skills and prevocational skills

To assess and screen the communicative profile of the mdvi and deafblind students, we have collected and adapted parts from the tools mentioned below. Through the informal assessment we collect elements from the unique communicative attempts of mdvi and deafblind students through observation, correlate them with the information collected from parents and the students'

medical file and transform them to individualized educational activities referred to communication and further developmental areas.

II.6. Selection of assessment tool

Assessment instruments refer to the modality of gathering information about the individual's level of development or characteristics, measuring objectively the abilities that are developed, identifying the needs and the required specific support in intervention.

Considerations in selecting assessment instruments
(Rowland, 2009)**:**
– The development of functional vision and functional hearing;
– The extended number of items that support the understanding of the early communication development and facilitate the measurement of progress in small steps;
– Enough examples to clarify the items and to determine how a skill can be observed in a child with visual impairment and multiple disabilities;
– Opportunities for observation in natural contexts;
– Chronologically appropriate items;
– Opportunity to identify next steps in the intervention;
– Need for specialized training.
– Version for parents?

II.7. Assessment Plan

Name of child _____

Date of Birth _____

Diagnosis _____

why do I assess	what do we need to find out	what do we know
how we will do that	how will I record it	who will be included
how will I use the collected data/observations		
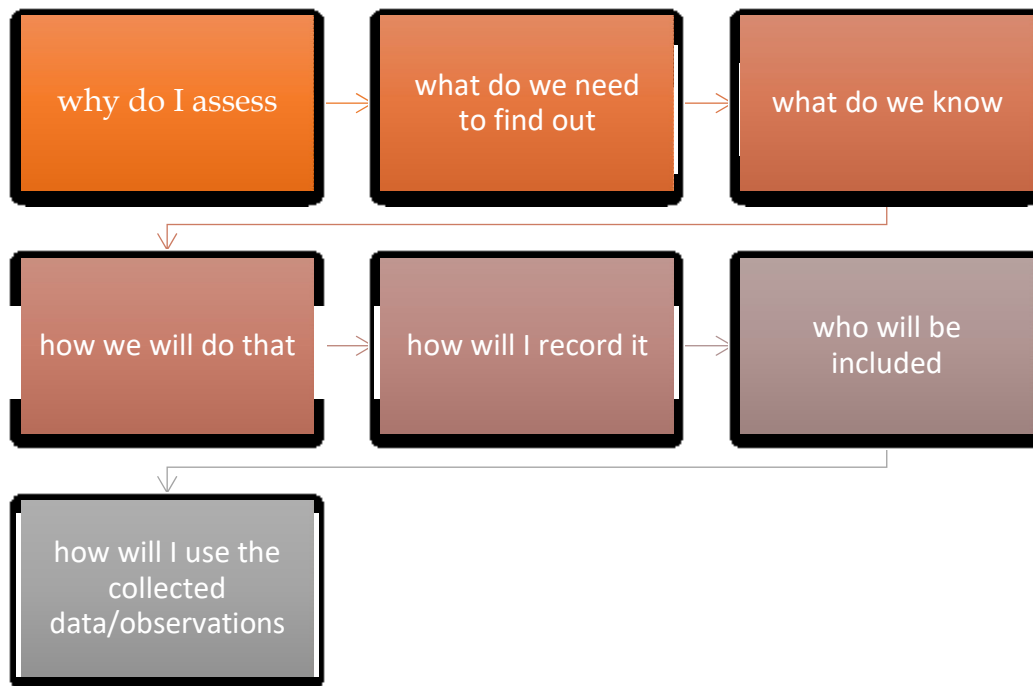
Exercise:
Identify a child with MDVI in your classroom/unit/group and reflect on an assessment plan, trying to answer the above-mentioned aspects.

II.8. Assessment Instruments of communication

(a synthesis of the Assessment instruments used in the educational institutions and centers within the consortium)

Tool	**The Oregon Project**
Age	0 to 6 years old
Domains	cognitive, language, compensate, vision, self-help, social, fine motor, gross motor
Description	Comprehensive developmental scale developed for children with visual impairment Relatively few items in preverbal and early verbal stages. Not easily translated into intervention goals. Not appropriate for children with more than a moderate hearing loss.
Full Reference	Anderson, S., Boigon, S. & Davis, K. (1991). The Oregon Project for visually impaired and blind preschool children. USA: Jackson Education Service District. Oregon Project Jackson Education Service District (541) 776-8580 www.jacksonesd.k12.or.us

Tool	**Oregon Project Curriculum for Visually Impaired and Blind Preschoolers – 5th Edition 1991**
Age	0 – 36 months plus
Domains	cognitive, language, socialization, vision, compensatory skills, self-help, fine & gross motor
Description	Criterion-referenced tool designed to provide assessment and curriculum guidance. Consists of 640 behavioral statements organized into eight areas: cognitive, language, socialization, vision, compensatory skills, self-help, fine and gross motor. Designed for children with visual impairments, blindness or other multiple disabilities.
Full Reference	Oregon Project Jackson Education Service District (541) 776-8580 www.soesd.k12.or.us

Tool	**Infused skills assessment**
Age	-
Domains	Social Communicative Interactions, Emotional Development, Senses/Motor Skills, Basic Concepts, Representation & Cognition
Description	Designed for use with children who are deafblind and children with significant cognitive impairments. Analyzing the strengths and weaknesses of students with visual impairments who may also have cognitive and behavioral challenges.
Full Reference	Infused skills assessment www.tsbvi.edu/andouts/oct06/infused-skills-assessment.pdf

Module II

Tool	**Dimensions of Communication**
Age	-
Domains	Developing a Communication Profile, Designing an Intervention Plan
Description	An assessment instrument designed to help teachers, educational specialists, speech-language therapists, psychologists, and other service providers evaluate the communication skills of children, adolescents, and young adults who have multiple disabilities, including severe or profound mental retardation and deaf blindness
Full Reference	Mar, H.H. & Sall, N. (1999). Dimensions of Communication. USA: United States Department of Education. http://documents.nationaldb.org/products/dimensions-of-communication.pdf

Tool	**Developmental Activities Screening Inventory – Second Edition (DASI-II) Fewell & Langley (1984)**
Age	0 to 5 years old
Domains	The instrument covers 15 skills categories ranging from sensory intactness, means–end relationships, and causality to memory, seriation, and reasoning.
Description	The DASI-II is an informal, individualized test that yields a developmental age based on the number of activities completed.
Full Reference	Fewell, M.B. L. (1984). «DASI-II Developmental Activities Screening Inventory». Austin Texas: Pro-Ed

Tool	**Hawaii Early Learning Profile**
Age	0 to 3 years old
Domains	cognition, language, gross Motor, fine Motor, social-Emotional, self-help
Description	Most items require intact visual and auditory abilities
Full Reference	Hawaii Early Learning Profile (HELP® Birth to 3, ©2004) www.vort.com/HELP-0-3-years-Hawaii_Early-Learning-Profile

Tool	**Hawaii Early Learning Profile for Preschoolers (HELP) 1995**
Age	3-6
Domains	cognitive, language, gross motor, fine motor, social-emotional, self-help
Description	Curriculum-embedded assessment stresses observation in natural settings and promotes activity-based learning. Charts display more than 650 specific skills in six developmental areas: cognitive, language, gross and fine motor, social-emotional and self-help. Developmentally sequenced activities in monthly increments.
Full Reference	VORT Corp. (888) 757-VORT

Tool	**INSITE Developmental Checklist: Assessment of Developmental Skills for Young Multidisabled Sensory Impaired Children. 1989**
Age	0-5
Domains	gross & fine motor, self-help, cognition, social, emotional
Description	Curriculum-embedded assessment of the areas of gross and fine motor, self-help, cognition, social, emotional, communication, vision, auditory and tactile development. Adaptations provided for use with children with sensory impairment and additional disabilities. Many skills are listed in the one- to two-month age range. Criterion-referenced.
Full Reference	Hope Publishing Inc. (435) 752.9533 www.hopepubl.com

Tool	**Adaptive Behavioral Scale**
Age	School age
Domains	The scale focuses on individual's strengths and weaknesses among adaptive domains and factors
Description	-
Full Reference	Lambert, N., Nihira, K. & Leland, H. (1993). "Adaptive Behavioural Scale". Austin Texas: Pro Ed

Tool	**Vineland Adaptive Behavior Scale**
Age	Birth to adulthood
Domains	communication, daily living skills, socialization, motor skills
Description	Many items require relatively intact auditory and/or visual abilities and few items at earliest developmental levels Designed to provide information applicable to intervention planning, but no clear translation into educational planning
Full Reference	Sparrow, S., Ccchetti, V. & Balla, D. (2005). Vineland Adaptive Behavior Scales, Second Edition (Vineland-II) www.pearsonclinical.com/psychology/products/100000668/vineland-adaptive-behaviorscales-second-edition-vineland-ii-vineland-ii.html

Tool	**INSITE Developmental checklist**
Age	1st version: birth to two years old, 2nd version: birth to six years old
Domains	gross motor, fine motor, self-help, cognition, social, emotional, communication, vision, auditory, tactile development
Description	Developed for children with multiple disabilities and sensory impairments Provides many items at early developmental levels
Full Reference	Morgan, E. C. (1981). The INSITE Model; Home intervention for infant, toddler and preschool aged multihandicapped sensory impaired children. Utah, SKIHI Institute

Module II

Tool	**INSITE Developmental Checklist: Assessment of Developmental Skills for Multihandicapped Sensory Impaired Children 1989**
Age	0 – 36 months plus
Domains	gross motor, fine motor, self-help, cognition, social, emotional, communication, vision, auditory, tactile development
Description	Curriculum-embedded assessment of the areas of gross motor, fine motor, self-help, cognition, social, emotional, communication, vision, auditory and tactile development adaptations, provided for use with children with sensory impairment and additional disabilities. Many skills are listed in the one- to two-month age range.
Full Reference	Hope Publishing Inc. (435) 752-9533 www.hopepubl.com

Tool	**Assessing the school-age student with dual sensory and multiple impairments**
Age	School age
Domains	Assessment
Description	Designed for children who are deafblind
Full Reference	Downing, J. E. (1996). Assessing the school-age student with dual sensory and multiple impairments. Department of Education: Washington

Tool	**CallierAzusa "G"**
Age	0-8
Domains	motor development, perceptual abilities
Description	Criterion-referenced scale for use with children who are deafblind or multihandicapped. Domains assessed are motor functioning, perceptual skills, daily living skills, cognition, communication, language and social development; 18 subscales within the domains. Observations are completed in natural settings. Parents assist in assessment by providing information.
Full Reference	Stillman et al. (1978). The Callier-Azusa Scale. Texas: The South-Central Regional Center for Services to Deaf-Blind Children and the University of Texas at Dallas. www.callier.utdallas.edu/calliercenter/evaluationand-treatment/azusa-scale

Tool	**Callier-Azusa Scale "H"**
Age	0-8
Domains	assessment of communicative abilities, representational and symbolic abilities, receptive communication, intentional communication, reciprocity
Description	Designed to assess communication abilities of children who are deafblind. Assessment based on observations and prior

knowledge of the child. Highly detailed at lower developmental levels

Full Reference	Stillman, R. & Battle, C. (1985). Callier Azusa Scale (H) scales for the assessment of communicative abilities. Texas: university of Texas www.callier.utdallas.edu/calliercenter/evaluationand-treatment/azusa-scale

Tool	**Program Guidelines for Individuals Who Are Deaf-Blind. California**
Age	0-8
Domains	identification, assessment, instruction
Description	Inventory of assessment tools
Full Reference	Dronek, M. (1990). *Program Guidelines for Individuals Who Are Deaf-Blind*. California: California Department of Education

Tool	**Communication development curriculum**
Age	School age
Domains	Communication
Description	School curriculum focused on communication development
Full Reference	Ορφανός, Π. (2004). *Οδηγός Εκπαιδευτικών σε θέματα Τυφλοκώφωσης και προτεινόμενο αναλυτικό πρόγραμμα για την ανάπτυξη της επικοινωνίας*. Παιδαγωγικό Ινστιτούτο, Τμήμα Ειδικής Αγωγής

Tool	**Communication Matrix**
Age	Birth to 2 years old
Domains	Expressive communication
Description	Designed for use with deaf-blind Comprehensive at lower developmental levels. The *Communication Matrix* (Rowland, 2011) capitalizes on the knowledge of familiar partners to obtain information about how an individual communicates in daily interactions. The Communication Matrix (Rowland, 1996) is a format for recording the current abilities of the child based on the seven levels of communication development. The scale is available at communicationmatrix.org and has been translated to several languages. The assessment tool gives a holistic view of the communication profile of the child and determines a comprehensive image of the child's communicative abilities.
Full Reference	Rowland, C. (1990). Communication Matrix. Oregon: Design to Learn www.communicationmatrix.org

Tool	**Assessing Communication and Learning**
Age	-
Domains	Getting Started. Gathering Information. Interpreting and Applying Results
Description	Communication assessment

Module II

Full Reference	Rowland, C. (2009). Assessing Communication and Learning in Young Children Who are Deafblind or Who Have Multiple Disabilities. Oregon: Design to Learn

Tool	**Home Talk**
Age	-
Domains	Information about the home, health, hearing and vision, communication; Interests, talents, habits, routines, behaviors, special needs • Rates child in Social interaction, Problem solving, Exploring the environment, and Discovery and Learning; Parent-Professional worksheet to identify educational goals and activities
Description	Assessment tool designed for use by parents and service providers who are deafblind and have other disabilities. The purpose is to get parents more actively involved in their child's educational plan
	Provides a picture of skills, interests, personality of the child and family routines
Full Reference	Harris, J., Hartshorne, N., Jess, T., Mar,H., Rowland, C., Sall, N., Schmoll, S., Schweigert, P., Unruh, L., Vernon, N. & Wolf, T. Home Talk. OR: BD-LINK https://nationaldb.org/library/page/789

Tool	**Hands on learning at school**
Age	3-8 years old
Domains	obtaining objects, practical uses, representational uses, social uses
Description	A tool for examining cognitive and social skills through interactions with objects.
Full Reference	Rowland, C. & Schweigert, P. (1993). Hands on learning at school. Oregon: Design to Learn

Tool	**The Functional Schemes Assessment**
Age	birth to 4 years old
Domains	gross movement; fine movement; mouth movement; visual perception; auditory perception; haptic-tactile perception; smell and taste; object perception; language non-verbal, verbal, comprehension; social perception; emotional perception; play and activities; toileting skills; undressing & dressing skills; personal hygiene; eating skills
Description	The scheme helps to determine where an individual is currently functioning. Areas of assessment are broken down development steps as observed in an individual with multiple special needs. After determining a person's functional level, appropriate individualized programming can be developed using the best materials, perceptualizing aides and equipment, and phase of educational treatment. The Functional Scheme helps the evaluator to re-assess the current learning program. The same functional scheme will be used to assess an individual throughout

their lifetime. The evaluator can identify what skills are emerging, performed under favorable conditions, or performed spontaneously.

Full Reference	Nielsen, L. (2000). The Functional Schemes Assessment. Denmark: Ministry of social affairs

Tool	**First things first**
Age	3-8 years old
Domains	-
Description	Communication assessment
Full Reference	Rowland, C. & Schweigert, P. (2004). First THINGS First. Early Communication for the Pre-Symbolic Child with Severe Disabilities. Oregon: Design to Learn

Tool	**Tactile symbols directory to standard tactile symbol list**
Age	-
Domains	Assessment
Description	Use of tactile symbols for vi and blind students with additional disabilities. Symbols for the categories of time, events, places.
Full Reference	Texas School for the Blind and Visually Impaired from https://www.tsbvi.edu/tactile-symbols

Tool	**Assessing Communication and Learning in Young Children who are Deafblind or Have Multiple Disabilities**
Age	-
Domains	-
Description	This guide is an assessment guide to help professionals and family members better understand children who are deafblind or who have multiple disabilities.
Full Reference	Assessing Communication and Learning in Young Children who are Deafblind or Have Multiple Disabilities

Tool	**The Child Guided-Approach to Assessment using the van Dijk Framework for Assessment**
Age	-
Domains	assessment
Description	The Child Guided-Approach to Assessment using the van Dijk Framework for Assessment follows the lead of the child as it attempts to discover the processes a child uses to learn rather than what he or she knows. It builds upon child strengths as interventions are developed based upon the findings of the assessment (Nelson, van Dijk, Oster & McDonnell, 2009; Nelson, van Dijk, McDonnell, & Thompson, 2002).
Full Reference	The Child Guided-Approach to Assessment using the van Dijk Framework for Assessment

Module II

Tool	**CVI Range**
Age	Age range: 6 moths to adulthood
Domains	assessment
Description	Rating of the child's visual response in nine of the characteristic behaviors such as fixation to objects or faces, attention to lights and movement. Ratings are recorded based on observation, interview or direct contact. Suggests targeted principles to assist in the promotion of functional vision
Full Reference	Cortical Visual Impairment: An approach to assessment and intervention, Christine Roman – Lantzy, AFB Press, 2007

Tool	**Assessing the Core Curriculum**
Age	-
Domains	Curricular assessment
Description	Students with visual impairments with moderate multiple disabilities and attend the general school setting follow the national curriculum. These students are assessed by the classroom teachers using various test according to the subject taught (tests prepared by the teachers). The Ministry of Education and Culture in Cyprus set some "success" and "adequacy" indicators for each subject of the core curriculum. Students in the 3rd and 6th grade of elementary school undergo assessments prepared by the Cyprus Pedagogical Institute.
Full Reference	Standardized tests in 3rd and 6th grade prepared for all students in the country by the Cyprus Pedagogical Institute. Tests prepared by the teachers in each subject area to determine the "success" and "adequacy" indicators.

Tool	**Curriculum tracking and P-Level Assessment, Whitefield schools, Exploring and Ordering the World, Reaching out Curriculum (UK)**
Age	-
Domains	Curriculum-based assessment
Description	Curriculum-based assessment of functional skills of vision, hearing, touch, smell and taste to explore and organizing the environment

- **Level P1(ii).** Pupils show emerging awareness of activities and experiences. They may have periods when they appear alert and ready to focus their attention on certain people, events, objects or parts of objects. They may give intermittent reactions.
- **Level P2(i).** Pupils begin to respond consistently to familiar people, events and objects. They react to new activities and experiences. They begin to show interest in people, events and objects. They accept and engage in coactive exploration.

60

- **Level P2(ii).** Pupils begin to be proactive in their interactions. They communicate consistent preferences and affective responses. They recognize familiar people, events and objects. They perform actions, often by trial and improvements, and they remember learned responses over short periods of time. They co-operate with shared exploration and supported participation
- **Level P3(i).** Pupils begin to communicate intentionally. They seek attention through eye contact, gesture or action. They request events or activities. They participate in shared activities with less support. They sustain concentration for short periods. They explore materials in increasingly complex ways. They observe the results of their own actions with interest.

Full Reference	-

Tool	**Developmental Assessment**
Age	-
Domains	Assessments are carried out in all areas of development: personal and Social Awareness; social / emotional and moral development; gross and fine motor skills; speech and language development; cognitive development.
Description	Based on the national curriculum for kindergarten a multidisciplinary team uses a checklist to assess a child to draft the Individual Education Plan (IEP). A scale is used to define the progress of a child at the beginning of the School year, in February and at the end of the school year. 0: No skill / has not been achieved, 1: Low ability / has been achieved with too much support, 2: Limited ability / has been achieved with a lot of support, 3: Enough skills / has been achieved with some support, 4: Has been fully achieved.
Full Reference	Assessments are carried out using: – Clinical observation of the child in a classroom, in the dining room, in the physiotherapy and occupational therapy room, outdoors and in the play-ground. – Use of objects, toys, applications, computer application, communication devices. – Use of the "Tactual Profile" by VISIO.

To collect information about the communication assessment of a child we use:

– Clinical observation of a child throughout the school day in various settings,
– Interview with parents / caregivers, teachers and assistants, monitoring mechanism for behaviors,
– Use of Alternative and Augmentative devices (single switch, double switch, step by step communication, set of switches in a row, more complicated devices),
– Use of a computer application such as "Mind Express",
– Use of applications on an iPad
– Use of toys, songs, short stories,
– Use of objects of reference and Tactile symbols, Communication boards and communication books.

Members of the transdisciplinary team use exclusively the tools mentioned below:

1. Psychologist: clinical observation, WISC V, Achenbach questionnaires, the child autism spectrum quotient, Vineland- II Adaptive Behavior Scales, Battery assessing school preparation, parents' interview
2. Occupational therapist: clinical observation, sensory integration, optometry, DTVP-2 (Developmental Test of Visual Perception-2), neuroanatomy
3. Speech therapist: observation through playing, informal assessment, phonology test (words, pictures), mouth-facial assessment, following of orders
4. Physiotherapist: Berg balance test, Pedi scale, Gross motor function (gmfm), balance and walking test, Tinetti (performance-oriented mobility assessment)
5. Social service: parents' interview

Exercise

Reflect, answer and discuss the following aspects regarding the assessment of communication.

Questions	Answers	Discussions
What is the purpose of assessing communication?		
How do you plan to prepare for an assessment?		
Which are the aspects you need to take into consideration before starting the assessment?		
What do you think can be possible barriers?		

Module II

Who can give you information about the child?

_____ _____

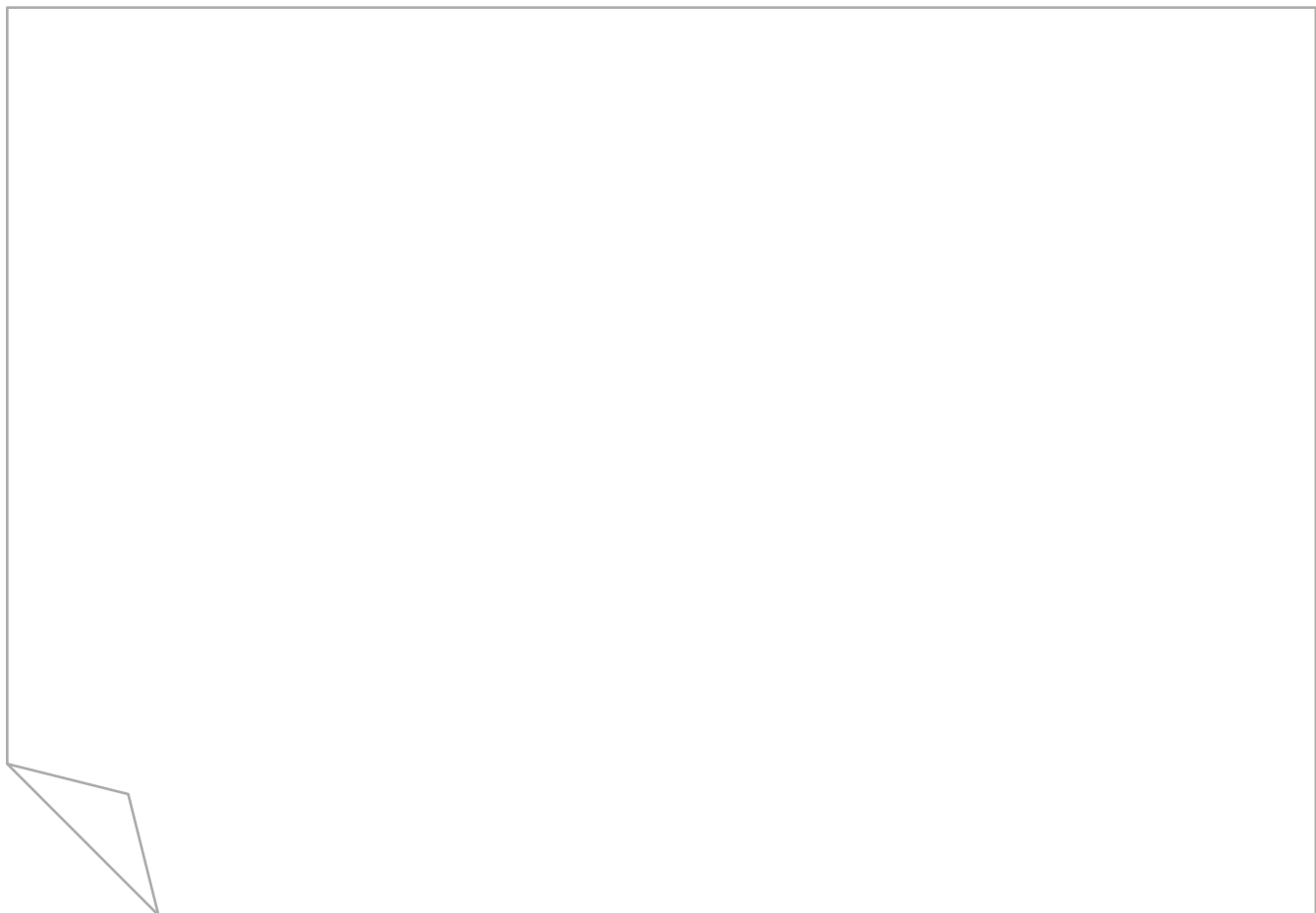_____ _____

_____ _____

_____ _____

How will you record the results of the assessment?

_____ _____

_____ _____

_____ _____

_____ _____

What will you do with the results?

_____ _____

_____ _____

_____ _____

_____ _____

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Module

Specific interventions in the development of communication skills

III

Rowland & Schweigert (1993) refer to the reduced opportunities for functional communication due to sensory, motor and cognitive limitations, but also due to lack of a responsive environment to the communication initiatives of children with visual impairment and multiple disabilities.

Aitken et al. (2000) state that language is better acquired and developed within interactions with adults, in the contexts of daily activities and that the environment should be secure, allowing the child to anticipate and take decisions.

Development of communication must take into consideration the following principles (Gleason & Smith, 1997):

- establishing predictable routines with clearly defined start and end moments;
- offering opportunities for negotiation and decision-making;
- enough time to explore and offer time-out periods;
- observing and identifying the indices and signals;
- imagining your own games between child and adult;
- using mistakes as learning opportunities;
- encouraging the use of all sensory information;
- adapting the learning environment;
- monitoring the level of incentives;
- encouraging interactions between children.

Reflection:

Are these reduced abilities determined by reduced potential for developing communication abilities or it is the reduced capacity of the environment to enhance the real potential of development of communication?

Promoting communication in children with severe vision impairment and complex needs is a major challenge (Knight, 2014).

Strategies to create opportunities:

- responsive environment;
- availability of adults to offer the possibilities of taking decisions and offering options;

- offering enough time to initiate communication and development of responses;
- accepting variety of responses;
- context based interactions and behaviors;
- natural environments.

Pease (2000) argues that to determine which communication method is most adequate for a child with visual impairment and multiple disabilities, we need to consider several aspects:

- the level of functional child view;
- child's functional hearing;
- child's functional vision;
- the level of tactile sensitivity development;
- the child's motor development level;
- the extent to which the child uses his vocal cognitive skills;
- present level of communication.

Communication of children with visual impairments and multiple disabilities presents particularities, especially in early stages of development, when there is difficulty in interpreting what the child wants to express and what he or she understands. Adults are the ones who attribute meaning to children's communication behaviors, and these behaviors are not always clear and explicit. These behaviors can be visual focus focused on an object, the return of the head to a certain object, gestures, vocal productions, smile, crying, and different positions. To develop meaningful environmental concepts, we will have to relate and understand how children access and understand the world.

Experiences must be created, so that useful and meaningful concepts are formed and used, and the child acquires knowledge of the world in which he or she functions.

Reflections:

- How does the intention to communicate appear?
- How does the meaning develop?
- How does the dialog appear?
- How does understanding happen?
- How does communication / language occur?

Dore (1974) and Bruner (1981) – (citing by Chen, 1999) underlines the main functions of the **early communicative behaviors** at children without disabilities:

- Behavior regulation; to modify adult's behavior by refusing, asking, protesting;
- Social interaction: to seek attention, comfort, interaction,
- Joint attention: to make comments on objects and events that are shared as common experience.

Children with MDVI do not put into action all the functions of the communicative behaviors, they mainly use communication to protest, refuse, reject and request objects or actions (Wetherby and all, 1989, apud Chen, 1999).

Development of concepts is realized only within communication interactions of the child, including co-creation of significance (Nafstad & Rødbroe, 1999).

The conditions for sustained interaction are:

- Alignment: adapting to the rhythm, emotions, movements of the child, without the adult looking for meaning or interpretation. The goal is to take up the dynamics of the child's actions.
- Availability: The adult will follow the child's moving initiatives and cause it through proximity and distraction movements, imitation and completion, support.
- Establishing predictability: child imitation, contingency, repetition with small variations of responses to the child's initiatives provides predictability. Predictability brings coherence and significance. Predictability also means routines, but also the surprise element.

III.1. Milieu approach in developing communication

The **Milieu approach** refers to development of language and communication skills within the natural and functional environment of the individual, thus creating communication opportunities that support the child's needs and interests in a secure and trustful interaction (Hathazi, 2015). This approach is a part of a transactional approach that is based on social

communication, emotional regulation and social support (Yoder & Waren, 2002).

The basic principles of using Milieu Approach are:

- Setting communication development goals which are about acquisition, training, development or consolidation;
- Creating communication routines so that repeated activities are predictable and offer interaction opportunities;
- Following child's initiatives.

Using specific strategies to increase turn-taking activities; giving the child enough time to answer, encouraging signs, giving examples, modelling behaviors.

The characteristics of the Milieu Approach refer to (Kaiser & Trent, 2007):
- natural interactions
- following the child and not guiding the child
- initiatives of the child.
- learning experiences during activities
- modelling language
- use of stimuli as reinforcement for the child
- use of prompts

Recommendations for the development of language and communication in natural contexts:
- establish routines, children will know expectations and modalities of interaction;
- establish communication cues for initiating and finalizing an activity;
- stop the activity to create opportunities for the child to ask for continuation;
- be available for the child,
- interpret all communication cues and signals;
- identify the way the child asks for help;
- identify if the child makes any comments /describes or asks questions;
- use role paying and social scenarios;
- use play-based activities;
- extend language while interacting;

- observe and listen to the child;
- use books and story-telling even if the child is pre-verbal, draw attention on characters and actions.

III.2. Routine based interventions

Chen (1999) proposes the development of turn-taking routines that focus on communicative interactions, using prompts and support that will allow interactions develop in dialogue and conversation. **Dialogue can be vocal, tactile, verbal.**

The main components of dialogue are turn-taking, identified moment of beginning and ending dialogue, focused- attention, shared experience, meaning, continuity.

Natural opportunities for turn-taking games in daily contexts are: playing peek-a -boo, imitating the child's sounds and movements, during routines such as feeding, bathing (Chen & Haney, 1995 apud Chen, 1999). Chen (1996, apud Chen 1999) identifies different types of routines that parents and specialists use to adapt turn-taking routines according to the developmental and communicative needs and abilities of the child.

Imitation-based routines refers to repeating the child's sounds, actions on objects, movements. It is about imitating the child's behaviors in mirror, then modify or stop so that the child is getting aware and initiates behavior for continuation or start imitating the adults' responses.

Game-based routines: refer to predictable tactile or movement games that the child already plays and recognize, but there is a delay in the sequence that the child is already anticipating, so that the child feels to react, asking for continuation. Thus, the child gets aware that he can have an impact on environment through communication.

Action-based routines refers to everyday activities of the child that involve turn-taking and joint attention to specific objects in which the adult describes the actions and points out to what is happening while carrying out the action though comments.

Module III

Reference-based routines refers to turn-taking, joint attention, focus on symbolic language, verbal responses from the child. The adult names and provided verbal or tactile labels to facilitate concept development and language, thus modeling the child's communicative behavior and productions (Chen, 1999).

Brown et al. (1987) developed the Component Model of Functional Life Routines, which extends the typical task analysis approach to assessing and focusing on critical abilities related to the qualitative aspects of activities. The authors maintain that the traditional approach to task analysis refers only to the motor component of the activity or routine and omits the natural indices used to initiate and complete the routines, especially omitting the types of participation that are associated with the actual mastery of routines (options, decisions, communication). Everyday routines provide an optimal context for young children to acquire and refine skills, because they are repetitive, predictable, functional and meaningful. (Cheslock & Kahn, 2011; Hughes-Scholes & Gavidia-Payne, 2016).

One of the ways to implement the routine-based approach is proposed by Flores and Schwabe (2000) that describes the following steps:

1. Identifying the objectives in the individualized service plan;
2. Identifying the environment in which interventions can be planned and carried out;
3. Analysis of the activities and routines in which objectives can be achieved;
4. Development and implementation of routine interventions;
5. Collect data to highlight results.

Exercise
Group activity

Discuss with colleagues about the meanings and implications of routines for children with MDVI.

Identify daily routines for a child with MDVI from your classroom/group/unit.

Describe the routine that the child has more frequently during a day and reflect on the implications for the child.

Identify your support/input within the routine.

Try to modify routine to increase opportunity for learning.

Based on the routine-based approach we suggest the following Assessment Sheet

Daily routine of the child	Outcome for the child	Support from specialists	IEP goal	Observation

Module III

Activity: Answer to the child's behavior cues

How it works: The adult reacts immediately to certain behaviors of attention and interest from the child.

Benefits: The child continues to produce those behaviors because they represent a communication pattern and a feedback model. The child feels understood and motivated to continue this behavioral dialogue.

Remember!
- The adult must observe the child very carefully and learn his or her behavioral cues.
- The adult must choose the best way and method of communication depending on the child's development.

Activity: Using repetition and predictive programs

How it works: Using repetition and offering additional information are relevant input strategies. Certain key words or sentences are used again and again to highlight the significance of some events or to get the child used to specific objects. These key words will always be associated with the objects or the tangible pictures thus creating verbal routines.

Benefits: Through verbal routines the child begins to manipulate and understand the environment.

Remember!
- Always associate the key words to create verbal routines when doing a simple activity.
- Create verbal routines through saying hello, daily educational activities, serving lunch, cleaning the table, using the bathroom, etc.

Activity: Identifying favorite objects and activities

How it works: Identifying favorite objects and activities can be accomplished through interviewing the parents about the daily home program and activities of the child or through observing the child in their daily activities at school.

Benefits: Favorite objects and activities usually generate a positive answer and a positive attitude from the child. They are stimulators and motivators for new situations or attempts.

76

Remember!
- The observation period is time consuming but crucial for a correct identification of the child's preferences.
- The child's preferences can change in time and in different settings.

Activity: Identifying communication behaviors

How it works: The adult must identify those behaviors that the child can control voluntarily. They can be: maintaining visual contact, turning the head, verbal utterances, etc.

Benefits: By using these behaviors the child can create a communication setting which will be beneficial in future social contexts.

Remember!
- Use three simple procedures to identify the behaviors:
  - Presenting the object and observing the child's behavior – in expectation of a voluntarily answer.
  - Suspending the process: Presenting a favorite object or activity to the child and then suddenly suspending the activity or moving the object. The behavior of the child will be closely monitored to identify the displays which indicate the desire to restart the activity (verbal utterances, arms movement, changing body position, reaching hands)
  - Ignoring an expected or anticipated event: This procedure is based on ignoring or non-choosing of a usual event in the daily activity – event that the child can anticipate.

Activity: Learning behavior communication

How it works: It creates opportunities and needs to communicate. Presenting an object, suspending the process and ignoring an anticipated event are the basis of behavior communication. After creating a list of the child's preferences and identifying voluntarily controlled behaviors the next step is manipulating the environment to offer to the child opportunities to use the request functions of communication.

Module III

Activity: Using the educational environment in building specific communication behaviors

Definition: Educational environment refers to the variety of behavioral techniques which are used in the natural environment to acquire specific learning skills.

How it works: Environment techniques include three basic elements:
  – Arranging the environment in such a way that it creates the need for a specific communication behavior;
  – Identifying specific target behaviors;
  – Applying specific educational procedures.

Mand-model procedure in teaching (Togram & Erbas, 2010; Halle, 1982; Warren, 1986, apud. Maja, 2012) represents a sequential communication training technique with the following steps:
  – Creating communication opportunities
    o Using environment techniques like the once mentioned above and manipulating environment variables to encourage communication. It is crucial to correctly identify the objects, persons and events that interest and motivate the child.
  – Stop and wait
    o The child must initiate the communication by eye contact, indicating an object or a drawing – the teacher does nothing but look at the child and wait.
    o In the next step the teacher turns away from the child to encourage a behavior of drawing attention from the child: verbal utterance, AAC switch, etc.
  • Offering a cue
    o Usually the cues are giving when the child is not able to answer or when their responses are wrong or unsuited. It is important that cues are not frequently offered because otherwise the child will wait for a series of cues before answering correctly.
    o When a child does not respond in the waiting period, the adult will use a verbal cue like: *What do you want? Can I help you? Tell me what you want to do now.*

Activity: Using suggestions and help

How it works: There are certain suggestions an adult can use to build a communication behavior with the child. One of those is MODELING. This could be an efficient approach for children with generalized imitation strategies that can mirror the model offered by the adult.

Physical and Tangible suggestions imply physical manipulation of the child to obtain a certain behavior (Togram & Erbas, 2010**).** For instance, to teach the child how to reach his hand to indicate an object the adult will use a physical suggestive action of moving the child's hand and arm to execute the desired action. The input of the adult will decrease progressively until the child will do the movement on his own.

Remember!
- When using physical suggestions, it is important to choose other communication methods than the verbal one because usually the children will not have a developed verbal vocabulary and are not able to decode the meaning of the words.
- The child will actively process the information given and will express the need to communicate.
- The communication behavior of the child has an impact on their environment.
- The adult can use verbal inputs to implement the language in the child's experiences.

III.3. Co-creative communication: method of intervention in communication

Nafstad and Rodbroe (1999) highlight the function of co-regulating communication. Communication is made when a relationship and emotional involvement has been established between the child and the adult who is a communication partner. Synchronization or shared rhythm between the two partners, the emotional dialogue that is achieved through their responsiveness and sensitivity to emotional states, as well as taking the rhythm of the child and giving time for answers is essential in ensuring the success of the interaction. By negotiating or co-regulating social interaction, proximity,

distance and exploration, the two partners develop shared communication behaviors from shared experiences and the common repertoire of sounds, movements and gestures.

The essential principle in addressing co - creative communication is that children with multiple deficiencies are, like other children, dependent on engaging in emotional, social and communication relationships with people to facilitate general development (Nafstad & Rødbroe, 1999, p.13). The communication partner plays an important role in the dialogue. In the interaction, the child must be an active participant who is involved and directs his / her own development (Daelman, Nafstad & Rødbroe, 1993). Motivation is an essential aspect of interacting and communicating. The essential motivation for communicating for a child is that he is actively engaged in co-creating, sharing and expanding the basic common meaning and he is engaging in co-creating a common world (Nafstad & Rødbroe, 1999, p. 19). In the conception of the two authors the basis of communication development is the emotional relationship between two people, which is the basis of three dyadic relations, namely the co-regulation of social interaction, proximity and distance, as well as exploration. Co-regulation of social interaction refers to intersubjectivity and equalization between two interaction partners. It creates a relationship of security, experience sharing, establishing a relationship of trust, in which the two are on the same wavelength, in an "in tune" relationship, engages in activities, creates meaning and negotiates interpretations. Co-regulation of proximity and distance is done based on common experiences and interactive social play, the adult realizing by play the safety that allows the child to show a mutual emotional availability. The adult should be present, but he should not be intrusive, forcing and insisting so that the child may refuse to continue the activity and interrupt the interaction. Co-regulation of exploration also refers to the safety relationship in which the child is prepared to explore the environment, being in a safe interaction with the adult.

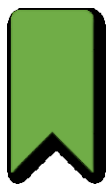# III.4. Alternative and augmentative communication

There is a wide range of AAC systems and devices that are used by children who have visual impairments and additional disabilities. They can be unaided, such as the use of gestures or sign language, or aided, using a symbol system or a device, such as one that plays a recorded message when the child presses a switch. In fact, the use of alternative and

augmentative systems means a wide range of integrated components – signs, gestures, pictures, symbols, words – which offers support, develops communication, learning, participation, the independence level and the quality of life for persons who benefit from these aids (Knight, 2014).

The main components of the communication process which involves the use of augmentative systems are, according to Burkhart (2008, cited by Tufar, 2015):
- The focus on interaction and communication and not on technology;
- The evaluation, as a permanent process, a dynamic one, performed by a multidisciplinary team;
- The use of the multiple systems Low or High-Tech;
- Active learning;
- The immersion into language, which must start as early as possible;
- A permanent training, practice, especially for children with severe disabilities;
- Focus on an inner motivation.

Augmentative and alternative communication methods can be unaided or aided, using objects or devices. Examples of unaided methods of communication include gestures, facial expressions, vocalizations, speech, and sign language. Examples of aided forms of communication include the following:
- Using an actual object to convey meaning; for example, the child hands us a cup to communicate the fact that he/she is thirsty
- Pointing to symbols, such as pictures or textures on a communication board or in a book
- Activating a device; for example, the child presses a button on a recorded speech device, initiating auditory output that says, "I'm thirsty."

It is important for the child to have both aided and unaided methods of communication. Learning unaided methods of communication is important because a device or other communication aid may not always be available in every situation in which your child needs to communicate (Knight, 2014).

The components of an AAC system are represented by **symbols, techniques and devices** (Tufar, 2015).

Module III

The symbols are representing concepts, the *system of symbols* is an ensemble of objects/images/signs which replaces/suggests something else by association/resemblance, or by convention. There are:

- Tangible symbols (objects, embossed drawings);
- Gesture, manual signs;
- Sounds;
- Photos;
- Images, drawings, graphic symbols (PCS- Picture Communication Symbols, Widgit Rebus Symbols, Makaton Symbols, Bliss Symbols, Braille Alphabet);
- Electronic generated speech;
- Oral and written language.

According to the comprehension level of the child, we can choose the proper symbols for the child. Symbol systems can use pictures, objects, or other tactile symbols as a communication method. Each symbol has a meaning. For example, a cup (either a picture or an actual cup) may represent "I want something to drink." A piece of chain or picture of a swing may be used to represent "go to the park." Your child can point to a symbol on a board or in a book or hand a symbol to someone to communicate expressively what he wants. Or you can show a symbol to your child to let him know what is going to happen next.

Remember!

- The selection and implementation of the AAC system will take place after an evaluation carried on by a multidisciplinary team of specialists: psychologist, physiotherapist, speech and language therapist, ergo therapist, special education professional, social worker, family.

- The selection and implementation of the AAC system depends on the user's diagnostics: developmental delay in communication, hearing impairment, intellectual disability, autism spectrum disorder, visual disability, cerebral palsy, aphasia, etc.

- The evaluation of the AAC user in the field of communication covers the following aspects:
  - o Nonverbal communication
  - o The ability to understand speech
  - o The ability to express verbal and nonverbal language

- o Communication environment including the level of support from the family or the specialists
- o Learning abilities
- o The motivation for communication
- o Starting communication
- o Making choices

– The evaluation of the intellectual abilities implies aspects of the cause-effect relationship, symbolic comprehension, understanding sequences, classification, reading abilities, memory recognition and reproduction, establishing connections between the objects.

– The aim of a motor evaluation would be the physical ability of a future AAC user to access a communication tool, the ability of handing objects over, of making simple gestures, of signing or of pointing with the fingers.

– When dealing with a person with MDVI with delays in the development of communication – especially expressive language – the specialists may recommend a device which carries different recordings of vocal messages (*Yes, No, Hello, Please,* etc.)

– The visual assessment of a future AAC user targets the perception of light, visual fixation and following, distance and size approximation.
- o A person with cerebral palsy with damage in the motor and communication areas could indicate some symbols, letters or pictures by eye movement, thus signaling to the others his/her need now (water, a walk, going to the bathroom, etc.)
- o The symbols or pictures will be chosen together with friends and family to establish a common communication **code**: the glass for *water,* the wheelchair for *walking*.

– The evaluation of hearing is also extremely important in the selection of the AAC system. For example, if a person is deaf, then they should use sign language. When a deaf person wants to communicate with a hearing person who doesn't know sign language, they can use a voice synthesizer by writing on the keyboard the message that is going to be heard.
- o After the evaluation of hearing the following can be established:
  - The communication environment of the person: text – words/ letters, pictures or symbols/ objects.
  - The size of their vocabulary
  - How they select an item from the communication system (input)

– How they convey a message to the user (output): visually –
screen, print – auditory – voice synthesizer.

AAC techniques are methods of accessing symbols to transmit one message. Nowadays there are some techniques which are mainly used (Popovici, 2016).

Direct selection consists in indicating or direct touch, by the user, of the symbol or the message by moving one part of the body (usually, the hand, the finger or the fist). Independently, the child identifies the symbols, indicates them in the correct order and then conceives the message. The method is viewed as quicker and less tiering than scanning and it can be used with all the communication devices. One of the direct selection methods is PECS (Picture Exchange Communication System), used specially by children with ASD, but also children with MDVI (we will make special considerations about PECS further on).

Indirect selection – scanning – refers to a technique in which one navigator (person or device) activates the options one at a time (visually, audio or both) and then gives a motor answer when he sees/hears the needed option. This method needs attention, good cognitive abilities, time and is very often exhausting and boring for the communication partners. It is recommended for persons with physical disabilities who are not able to touch or to push some symbols but can activate a switch.

Coding is a selection technique which associates direct selection with assisted scanning. The choice is indicated by a code, interpreted by the communication partner; the code must be memorized or posted on a visible board for both persons who communicate. Coding raises the speed of communication when the user can use only a few movements and when the intellectual level is high enough to enable this.

Facilitated communication is a technique in which the child receives physical and emotional aid to use communication devices when he has difficulties to do this independently. One adult, specially trained, is an intermediate between the child and the others, during communication. For example, the child can guide the adult's hand while he is indicating symbols on a device or is typewriting. This technique is quite used lately because it is less tiering for a child with disabilities but is still giving rise to controversies concerning the subconscious trial of the adult to modify the transmitted message.

III.5. Examples AAC how to select an item from the AAC system
III.5.1. Direct selection

How it works: The user indicates with a part of their body or with the help of a luminous indicator fixed on a body part. The user can indicate with the finger the image/symbol from a communication panel showing the action that they desire: to go to the bathroom (a picture with a bathroom), to eat (a picture with a spoon).

Remember!

If the user is blind, then the pictures are substituted with tangible objects: a spoon for eating, a soap for washing; or with symbols: the shoe from a doll stands for walking. The pictures, objects or symbols will be placed on a communication panel that is easily accessible to make choices by pointing.

Exercise

Objective: to create a list of 10 objects/ symbols/ pictures for 10 given actions.

Time: 15 - 20 minutes

Method: Think of objects/ symbols that MDVI children would find in their environment and that could be references for the following actions:

1. Getting dressed
2. Eating
3. Drinking
4. Going to the toilet
5. Washing hands
6. Putting on shoes
7. Going to the park
8. Hugging
9. Playing
10. Going home

Questions:

- Did you have more than one object in mind?
- How did you choose the object/ picture?
- Do you think that your objects/ pictures are relevant for the actions given?
- What is in your opinion the main purpose of the exercise?

III.5.2. Scanning
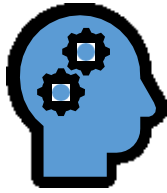
How it works: The communication partner indicates one by one the items on the communication board and the user indicates the preferred item by a determined action: rise of the hand, blinking, head bow, etc.
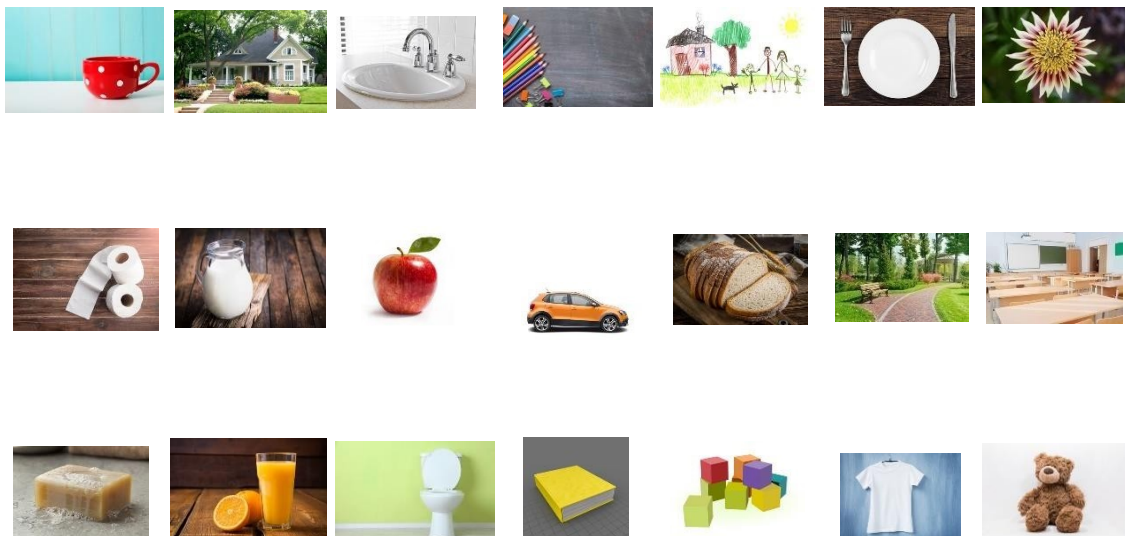
Exercise

Objective: To communicate a desired action by using the communication board.

Time: 25 - 30 minutes

Method: Establish a type of action (i.e. raising a hand, blinking, raising the shoulders, nodding, etc.) to select the pictures which your communication partner will be showing to you from the board presented below.
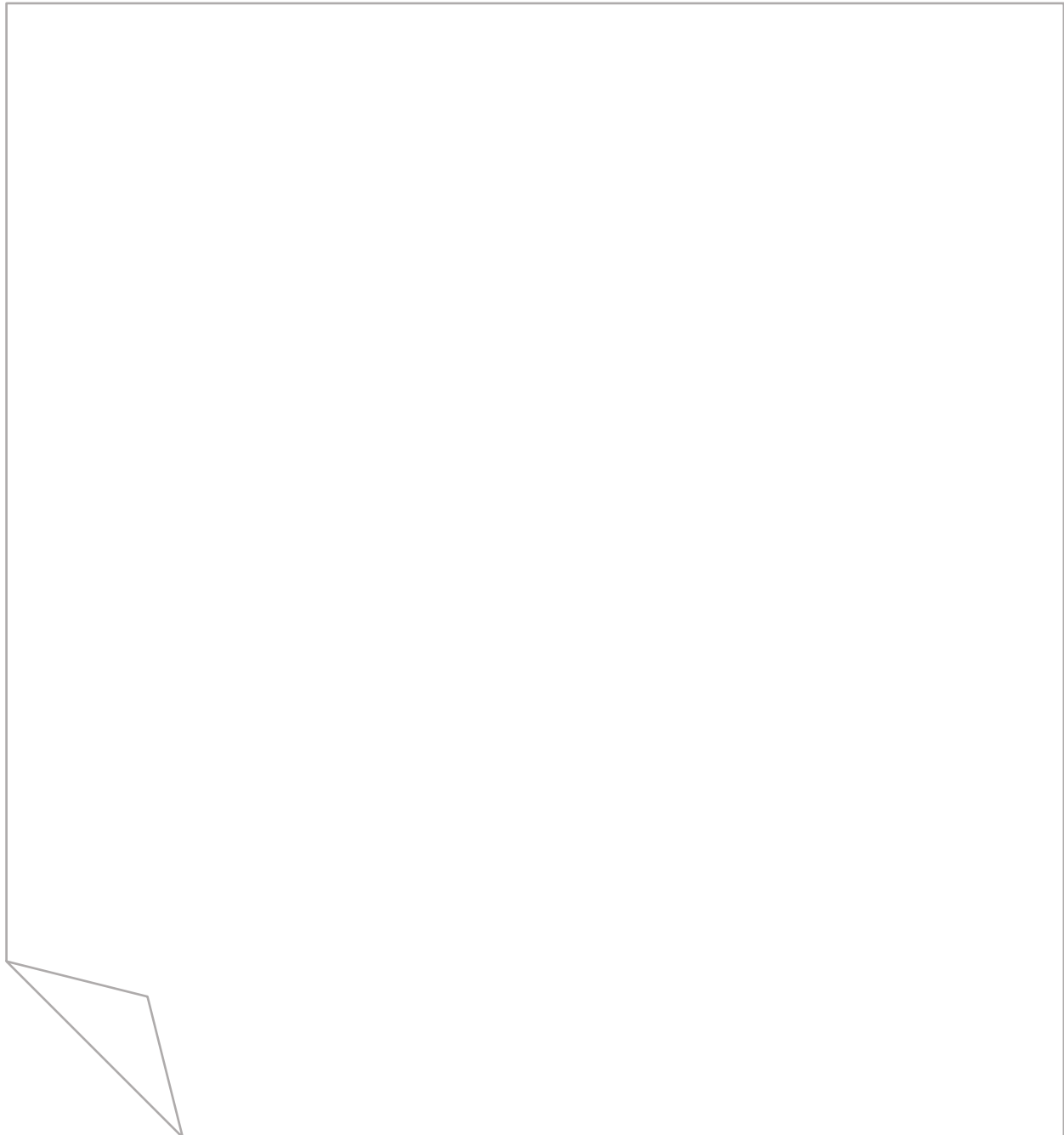
Think of two separate actions once you have studied the communication board. When you are ready show to your partner that they can indicating.

Ask your partner to write down the actions they understand you want to do.

Questions:

– How difficult was it to establish a signaling cue?
– Did your partner understand what you wanted to do?
– What did you use to ensure feedback?
– How much time did you spend on this exercise?
– Were you tired after you finished the exercise?
– Was your partner tired?
– On a scale from 1 to 10 (1 being not at all and 10 being very much) how frustrating was this experience for you and your partner?
– What is in your opinion the main purpose of the exercise?

III.5.3. Code scanning
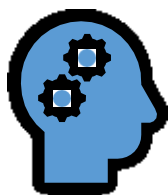
How it works: Codes are made by the combination of colors, words, letters or numbers. For example, the word BED presented on a red background or written with red letters means that the user does not want to go to bed. The same word presented on a green background means that the user wants to go to bed.

The letters can be presented in a table and by indicating them by the user or by scanning them by the communication partner, they can form sentences through which the two will communicate.

Exercise

Objective: To communicate two sentences with a communication partner using a table of letters.

Time: 25 - 30 minutes

Method: Establish a type of action (i.e. raising a hand, blinking, raising the shoulders, nodding, etc.) to select the letters which your communication partner will be reading for you from the table presented below.

Think of two sentences of seven words each. When you are ready show to your partner that they can start reading the table. Ask your partner to write down the sentences letter by letter as you select the letters, they are scanning for you.

A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z				

Questions:

– How difficult was it to establish a signaling cue?
– Did your partner get the sentences?
– What did you use to separate the words?
– How much time did you spend on this exercise?
– Were you tired after you finished the exercise?
– Was your partner tired?
– On a scale from 1 to 10 (1 being not at all and 10 being very much) how frustrating was this experience for you and your partner?
– What is in your opinion the main purpose of the exercise?

III.6. Intervention program for the implementing of an AAC system

GENERAL GOAL 1	GENERAL GOAL 2	GENERAL GOAL 3
Understanding the concept of communication	Developing communication abilities through tactile symbols	Learning the concepts by connecting symbols with the names of the objects
SPECIFIC AIMS	**SPECIFIC AIMS**	**SPECIFIC AIMS**
Answering simple questions	Using tactile symbols to indicate basic needs	Indicating the symbol of an activity by hearing its name
Answering simple instructions	Using tactile symbols to request or wish for something	Identifying an activity by presenting its correct symbol
Initiating communication	Using tactile symbols to make choices	Naming the objects, activities or concepts by the symbol showed.
Naming people/ objects	Using tactile symbols to reject something	

Exercise - How to choose the right AAC system

Objective: a better understanding of the different types of AAC systems and of which one could be right to use for the specificities of each child.

Activity: Participants are organized in small groups (4), feedback for the entire group

Time: 1 hour and 1/2

Materials: Pens, work sheets

All the participants are divided in small groups (4) and each group receives from the trainer a work sheet to fill in and after all the groups have done the activity the results are discussed with all the participants.

Exercise

On the work sheets the trainer presents case studies, two for every group and the participants will have, for each child, to express their opinion concerning:

– What are the aspects that we need to know about the child to choose an AAC system?
– Is it possible to choose one AAC system that could fit in any setting, in any environment?
– What is the AAC system proposed for each case (one, two)?
– What are the expectations that we might have after using one AAC system?
– In which areas of communication, we expect changes?
– Examples of possible conversations that we would have with case 1.
– Examples of possible conversations that we would have with case 2.
– What are the difficulties that could be encountered when we want to use one or another AAC system?

At the end of the time proposed for the activity, each group must present their answers for each one of the two cases and then the trainer organizes debates with all the participants, so that every person can express her point of view, arguments, possible solutions, when things are not quite, we are expecting.

III.7. The objects of reference

Children with vision impairment and multiple disabilities may have difficulties in processing and interpreting auditory and visual information.

As we know, many children with vision impairment have difficulty focusing their attention. In this case, they often fail to attend to something as brief as a spoken word or manual sign. And even if they succeed to attend, their difficulties continue, and this happens also because they may process information slowly. In the same time, children understand better everything when they really handle an object. If a child learns to attach a special meaning to an object, that object is regarded as an "object of reference". An object of reference can enable the child to obtain information from several senses: touch, vision (if they have some useful sight), smell, taste, and sound (e.g. if they bang it against a surface). This is more reliable for them than relying only on hearing the spoken word, even if that is accompanied by a manual sign (Knight, 2014).

Objects of reference offer concrete methods to anticipate events and activities and in the same time, they can offer the opportunity of recalling events that already took place. They are used to associate human experiences to their symbolic representation. They are described as support for memory, comprehension facilitators and communication development methods (Hathazi, 2014).

As mentioned in the RNBI guide (Knight, 2014), objects of reference can play a key part in supporting communication for a child with vision impairment and complex needs:

– they can help the child to understand what other people say
– they can provide means to express his needs.

If we think that one child might benefit from objects of reference, we need to pay attention to some aspects in the beginning. It may be necessary to go through a period of trial and error. This is because we can`t possibly be sure whether the child will attach a special meaning to the object of our choice.

And of course, it will take time for the child to build up a link between the object and the item, place, person, event, activity or experience it refers to.

Module III

The gap between non-symbolic and symbolic can be reduced by introducing step by step objects of reference which can be classified in (Ockelford, 1992; Tufar, 2015):

- Index: a sign associated to the activity, it could be even a part of the activity (examples: fork=food, CD=music, sponge=shower)
- Icon: similar with the object visually or from a tactile point of view, it is not part of the activity, does not identify itself with the object. Some examples could be: a) miniatures - toy teacup=tea, b) associated objects – laces=shoes, c) objects with common features – straw=basket.
- Symbol: is not similar with the object, the bond is random. For example, a wood square attached to the bedroom door=bedroom

There is no universal code for the objects of reference, they must be selected according to the main aims of the activity, to each child's characteristics, to the objects or events that are represented.

One question that occurs is of course, how can we choose an object of reference? Selecting an object of reference for an item, place, person, event, activity or experience is really challenging because an object of reference is an object to which the child attaches a special meaning. It is therefore essential to view things from the individual child's perspective. The specific object should be something that one individual directly experiences and associates with the item, place, person, event, activity or experience (Knight, 2014).

To make an object of reference, we must think about an item that could be linked to an activity that the child does regularly, like playing with the ball. So, we can think of creative ways − for example using sound and smell − that we can use to help him/her make a link between that object and the activity. Then we must see if the child associates that object with the activity.

There are some simple principles that we must consider when we want to present an object of reference:

- presenting the same object every time,
- presenting the object right before the item, place, person, event or activity it represents,
- using that object every time it is needed,
- presenting in the same manner every time,
- presenting with the same accompanying speech/signing every time.

If we introduce more objects of reference, it is essential to consider the contrasts between them: we must try using objects that are not very similar, in order not to get the child confused. It is possible to create a repertoire of objects of reference for each child, that could be included in the structure of the *individual planner*, according to the activities. The schedules with objects or images could be like boxes, books, albums or posters. These could contain objects of reference, symbol images, visual and tactile clues or pictures that help the child understand the order of the activities during the day (Tufar, 2015).

The planners offer:

– security (the child will know what is about to happen and will anticipate changes),
– active participation for the decisions,
– the development of communication skills by using a specific kit of expressive signals, which will be transformed afterwards into sign language or oral language,
– the possibility of developing the concept of time.

To represent persons, we must choose items, clothes the child is used to explore when he or she meets that person.

The objects of reference will be always used in connection with some other communication methods, like gestures, signs or speech to reinforce the message and to prepare the child for symbolic and oral communication (if this is possible). The objects or cards with objects are attached on a board and used for communication and are not included in the activity, although some authors recommend this inclusion in the first part of the implementation of the communication system (Pease et al., 1988).

Objects of reference in the classroom

According to Knight (2014), if possible, objects of reference should become a means for the child to express needs and desires, and not just to support understanding. This means that the child must have access to their objects of reference, so they can select them when necessary. This can be a major problem for some children, particularly those who also have a motor impairment. For the mobile child, objects of reference can be stored on a section of accessible shelving, on hooks on the wall, or in a box; wherever they are kept, it is essential to adopt the following rules: ensure the child knows where they are kept always return objects of reference to the storage place

immediately after use allow the child free access to their objects of reference at all times.

For a wheelchair user, it will be preferable, perhaps even necessary, for the objects of reference to be reduced in size and made more abstract. If this is done, it may be possible for them to be kept in bag attached to the wheel chair, or in a book which is always kept on the tray.

Moving on with objects of reference

When the child has been using several objects of reference for some time, it may be appropriate (even necessary) to make them more abstract:
–   initially, they could be reduced in size,
–   later, part of the object could be used (e.g. instead of a whole cup to mean "drink", it may be just the cup handle) ,
–   later still, some objects can be turned into an abstract symbol; e.g. the cup handle could become a printed or tactile semicircle, which, eventually could become a printed letter "c".

Exercise How to choose an object of reference

Objective: a better understanding of what an object of reference means and how to adapt these objects for each child according to his/her specific problems.

Workshop: Participants are organized in small groups (4), feedback for the entire group

Time: 1 hour and ½

Materials: Pens, work sheets

The group is divided in small groups (4), each group receives work sheets with a questionnaire concerning objects of reference, must answer the questions and then a debate is proposed to clarify some aspects related to the way to choose an object of reference.

The trainer must prepare the questionnaire, along with some information about communication for children with MDVI, about systems of alternative and augmentative communication and of course about objects of reference.

Objects of Reference Questionnaire

1. What is, in your own words and opinion, an object of reference?
2. How can objects of reference help communication?
3. Should objects of reference be specific for children or they should be standardized for all children with MDVI?
4. Can you think about a few examples of objects of reference that you would use in your activities with the children?
5. When should we introduce an object of reference, so that the child is able to make a link between this one and some specific activity?
6. Do you think that an object of reference should be presented in association with a sign or with a spoken word?
7. How should we introduce objects of reference in the classroom?
8. If a child must use objects of reference for a longer period, do you think it is possible to make it a little bit more abstract?

The workshop can include also discussions and case analyses.

The trainer could prepare a case study for different situations in which a child has to make links between an object of reference and one specific activity.

III.8. Symbolic communication strategies

These strategies represent a way for the child to accomplish the transfer from tangible symbols to abstract ones, by transforming and adapting tangible symbols in drawings, written words, signs or speech. Using visual, auditory or motor learning strategies the child can remember tangible symbols and then transfer them in different situations. Symbolic communication strategies help the child to integrate the behavior of problem solving into speech patterns. Koch (1999) suggests that signs may be critical to the development of a symbolic code that allows children to create linguistic neural networks to organize, store and retrieve concepts.

Remember!

- Carefully select the vocabulary for the program.
- The messages used must be of interest for the child.
- Pick words that are descriptions of items in the child's environment.
- Use scenarios and dialogues to identify functional messages / vocabulary.
- Pay attention to the environment settings that the child prefers.

Exercise

Objective: to identify a possible list of questions to be used in a dialogue with the child with the purpose of identifying functional messages.

Time: 15 - 20 minutes

Method: identify a child with MDVI mentioning age, sex and communication development. Write down the questions you would ask to identify his/her functional vocabulary. Present to the other colleagues from your exercise group.

Questions:

- Were the questions in your list appropriate for the age you have mentioned in your description of the child?
- How many aspects reading their environment have you covered?
- Were there any questions about the child's family?
- What is in your opinion the main purpose of the exercise?
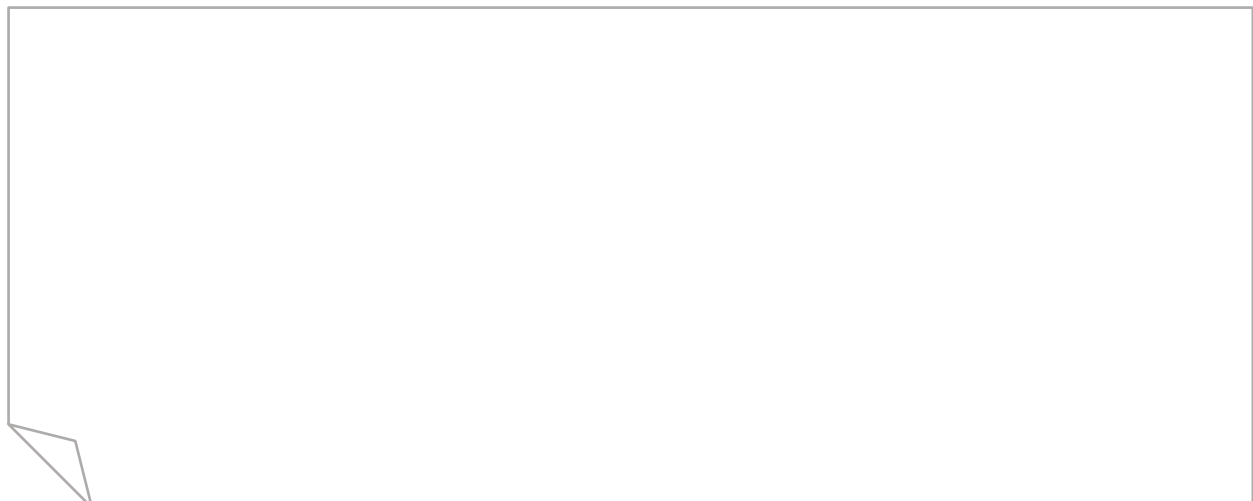
STORYTELLING

Definition: A technique of communicating a series of short events using verbal expressions, pictures, gestures, videos, etc.

How it works: By combining pictures, images, drawings, videos, significant gestures and speech to reproduce a series of events.

Benefits: Storytelling stimulates receptive communication behavior and provides examples of verbal and nonverbal expression.

Remember!

– Use pictures which illustrate the events and mark their sequence.
– Use images that are less detailed and that have a simple background.
– The drawings used must be clear shaped and very close to the natural form of the items.
– Phrases must be short and brief containing words which are familiar to the MDVI children.
– Avoid ambiguous expressions, figurative speech and words with double meaning.
– You can check the understanding of the story through various means on different levels of difficulty (Drocaş, 2009):
    o Recognizing and naming characters from the pictures
    o Arranging images in the order of the events;
    o Reading through pictures;
    o Questions and answers with and without pictures;
    o Roleplay;
    o Retelling the story with and without pictures.

Exercise

Objective: to identify a possible list of questions to be used in a dialogue with the child with the purpose of identifying functional messages.

Time: 25 - 30 minutes

Method: Create a simple story using 30 to 50 words. Read it to the other participants from your group and then ask them to

create a set of drawings for your story. Use the drawings to tell the story again. Together with your group create a list of questions you would use to check if the MDVI children have understood your story. Present your work to the whole group of participants.

Questions:

- How difficult was your story?
- What should be the age of the MDVI children who were meant to get your story?
- How difficult was it to make the list of questions?
- What is in your opinion the main purpose of the exercise?

III.9. Developing symbolic communication through calendars

Communication development facilitates expressive communication for MDVI children. It encourages the active participation in leisure and learning activities, the process of making friends and the acceptance from family and community members.

Developing an AAC system depends very much on the environment the child is in. The tangible systems of communication are an AAC non linguistical communication approach. They can be objects, associated objects, textures, images, pictures or drawings. Between these systems there is a progression of abstract representations.

The transition from concrete communication to symbolic communication must be very well timed. An MDVI child who has intentional communication skills and who presents an intentional behavior in indicating and selecting an answer will be able to use a system of abstract symbols. Even if the MDVI child cannot use these symbols for receptive communication he will use it for the receptive phase.

Calendar systems support communication development and offer emotional support and the opportunity of developing concepts as well as an active vocabulary (Hathazi, 2014).

The calendar systems also offer to the child the insurance of anticipating what is going to happen next, because MDVI children are often deprived of the sensorial experiences and of the access to natural items from the environment which could help them to anticipate events or to alert them when sudden changes happen during ongoing routines and activities. At the same time, calendar systems offer the MDVI child the possibility to report about past events or to describe future events, allow the understanding of simple subjects that have been discussed in a dialogue, develop time related concepts and features concerning a timetable or a schedule.

The communication calendar uses elements of the daily routine to establish the correspondence between words and their meaning through common activities in the natural context of the MDVI child. Children who use objects, pictures, images, photos, can understand the concept of routine and sequence and can identify a structure of expressing communication.

Symbols, pictures and photographs can be used in a variety of ways to support understanding and enable communication and choice-making (Boardman, Bernal and Hollins, 2014). For example, a symbols board consisting of pictures of drinks and food enables a person to communicate (either by direction of gaze, fist-pointing or finger-pointing) what they would like at mealtime. Visual schedules (also known as sequence strips) – a row of symbols on a Velcro strip – are used to show the individual what is going to happen next. For example, a strip of four symbols might illustrate: breakfast; tidy room; go to see their doctor; have lunch. Visual schedules (e.g. getting up; mealtimes; activities; going to bed) are particularly helpful for people who do not understand concepts of time in their daily routine (Anderson, 1997).

Remember!

When using schedules, journals and calendars the MDVI child will put in order with the help of the teacher all the necessary symbols to create a short sequence of the activity (for example: breakfast, getting dressed, washing hands). After creating two or three sequences the child is beginning to understand concepts like: *first, last, next*.

Module III

Teachers can use card or magnetic boards for these calendars, as well as compartmentalized boxes or Velcro. All of these are to be accessible to the child to control them. This way the child will get acquainted to routine and negotiation. The teachers create a repertoire of reference objects for each MDVI child which can be in the structure of the individual calendar according to the activities represented.

The visual calendar offers communication opportunities for all the activities and a way for the child to ask for his favorite activities.

Advantages of using the calendars (Rowland et al., 1995):
- Safety – the child knows what is going to happen and will anticipate change
- Active involvement in decision making
- Developing communication skills by using their own set of expressive signs that will afterwards be modeled into oral language or sign language
- Understanding the concept of time.

DAILY CALENDARS

The design of a daily calendar allows the representation of order in sequences of learning and activity. There is a wide range of materials that can be used: boxes of coffee, compartmentalized wooden boxes, plastic baskets tightened together. All of these must be steady so the MDVI child can feel the whole length of the calendar.

These calendars are supposed to facilitate the development of social interactions by creating dialogue and turn-taking opportunities.

Remember!

When engaging in a communication activity based on these calendars a teacher should encourage the MDVI child to (Levack et al.,1994):

- Select the appropriate symbol,
- Make a dialogue for the activity,
- Identify materials,
- Go to the spot where the activity takes place,

- Take part in the activity,
- Put the materials back,
- Put the symbol back on the calendar,
- Discuss and analyses the activity.

If the calendar systems are used more and more often the MDVI child will be able to understand and represent a bigger number of activities and the communication opportunities will enhance so the MDVI child will be able to negotiate the activities and their order.

Exercise

Objective: to create a daily calendar MDVI child you are working with.

Time: 30 - 40 minutes

Method: Find pictures or images that clearly depict your objects/ activity. Present the pictures on the calendar in the logical succession of the events. Be sure to represent the time on your calendar. Make sure to have a way of showing the MDVI child that the activity has finished.

Questions

- How difficult was it for you to find the right pictures?
- What should be the age of the MDVI children who were meant to be engaged in this exercise??
- How many sessions do you consider that are necessary for this communication exercise with the MDVI child?
- How soon do you estimate that the MDVI child will be able to use this calendar by him/herself?
- What is in your opinion the main purpose of the exercise?

III.10. Pictures as communication symbols

The recognition of pictures is a daily an automatic activity for most of the children. It appears without effort and children are used to name pictures in the books their parents read to them as part of their language development.

The ability to recognize and use pictures is obviously important for the use of augmentative and alternative communication (AAC) systems employing pictographic symbols (Stephenson & Lindfoot, 2009). Using pictures for receptive communication is also appropriate for children with severe intellectual disability who use pictures as a form of instruction, prompting, or cuing for vocational, leisure, living skills, or spoken language training.

Mayer-Johnson (1995) has developed the PCS (Pictorial Communication Symbols) which is a graphic symbolic system with 3000 to 7000 symbols that can be used according to the MDVI child's individual needs to create curriculum adapted materials.

The PCS system has the following morpho-semantic structure: people, social interactions, verbs, descriptive items, food and drinks and other nouns. These symbols that can be black and white or colored and very close to the real objects they represent, emphasize more the perceptive skills than the cognitive ones because they rely more on recognizing that on memory recollection and thus are less physically demanding.

When choosing vocabulary, there are a lot of options and decisions because each person has unique communicational intentions and needs. One of the most significant challenges for many individuals with intellectual and developmental disabilities is expressive and receptive communication. For instance, individuals with Down syndrome have characteristic oro-facial dysmorphologies that typically render productive speech difficult to understand, and concomitant intellectual disability may compromise their ability to understand language input (Bray, 2008; Chapman, 2003; Roberts, Price & Malkin, 2007; Wilkinson & McIlvane, 2013).

Individualizing the communication program implies involving the MDVI children and their parents in choosing the appropriate vocabulary. A very

popular and effective method is making a script or writing a sequence of a daily routine. For this reason, the teacher needs to have pictures representing a school bus for example, the road, the driver, the seats, the school and the child's home. In the beginning the teacher indicates a general picture with the main notions and ideas following a previously established order of events – with the people on the left and then the verbs and the nouns on the right.

For these PCS symbols there is an assistive technology software that teachers can use: Boarmaker V.6 and the Boardmaker Plus! V.6.

Teachers can create with this software different educational activities depending on the required curriculum. The activities can take place on the computer, laptop, tablets, etc., and can consist besides the PCS symbols also of photos, sounds, audio and video recordings specially made for the specific needs of the MDVI children the teacher is working with.

Exercise

Objective: to create a sequence of a daily routine of an MDVI child you are working with.

Time: 20 - 30 minutes

Method: Think of a sequence of a daily activity that you are doing together with the MDVI child. Divide that sequence in as many small steps as you can think of and connect each step with an image, sound, smell, touch, etc. Present your activity to the other people in your group.

Questions:

- How difficult was it for you to find the small steps in your sequence?
- What should be the age of the MDVI children who were meant to be engaged in this exercise? How difficult was it to find the images, sounds, etc. to accompany your steps?
- How many sessions do you consider that are necessary for this communication exercise with the MDVI child?
- What is in your opinion the main purpose of the exercise?

Module III
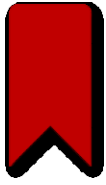
WIDGIT SYMBOLS

Widgit symbols were initially known as Rebus and were used in the last 25 years to support children with severe language disorders and learning difficulties. *The Widgit Literacy Symbols* (WLS) are used in Europe, North America and Australia and the WLS data base was translated in more than 20 languages thus being a real support in the mainstream educational system as well as in the special and inclusive educational system. The WSL contributes to the integration of children with reading disorders into inclusive and mainstream educational systems. The literature and the research done on the WLS mentions significant progress on the students' self-belief, on developing linguistic abilities and reading competences (Detheridge, Detheridge & Whittle, 2006).

By using the Widgit Symbol system, MDVI children with low vision can develop communication skills that lead to an independent living.

With the Widgit symbols teachers can illustrate concepts, can make sentences and can encourage and develop communication depending on the user's features of communication. Visualizing the meaning is possible with the help of the symbols on different levels of difficulty. Most of the symbols are concrete so the teacher doesn't need to explain any further. For the abstract notions the WLS set is mostly used because it was created based on common principles that support independent learning of new symbols.

As well as enhancing understanding and learning, symbols provide visual information that can support a child to know what to expect. A lot of the times, predicting what will or could happen might be very challenging, even in a familiar setting or activity.

Whether it is presenting visual information on what will take place in the lesson, or during the day, where they will be going, how long they have left; all will help to reduce feelings of anxiety or stress.

The *Widgit Literacy Symbols* have a generous vocabulary covering all the basic curricular subjects. It is individualized for adults and it can evolve to extremely complex levels. Even though the Widgit symbols have a schematically structure they include morpho-syntactical features that allow very complex expressions (Detheridge, Detheridge & Whittle, 2006). With Widgit one can express

linguistical shades such as verbal tenses, plural of the nouns, degrees of comparison.

Symbols in general and Widgit symbols specifically, can help with (MacDonald, 1998):

- Communication - creating communication books can help children acknowledge their own decisions.
- Independence and active participation in the activities.
- Reading and learning – the symbol software encourages readers to write by selecting the symbols out of a predefined set.
- Creativity and expressing own ideas – creating letters and stories of their own ideas and feelings.
- Accessing information – all people have the right to information and need accessible formats.

III.11. Picture Exchange Communication System (PECS)

Picture Exchange Communication System is a unique alternative/augmentative communication system developed in the USA in 1985 by Andy Bondy and Lori Frost and was first implemented with pre-school students diagnosed with autism within the Delaware Autism Program. Since then, PECS has successfully been implemented worldwide with thousands of learners of all ages who have various cognitive, physical and communication challenges. The method emphasizes the importance of creating a good relationship between the child and his communication partner and it means much more than waiting for signals and reacting to these signals.

Concerning the advantage of this method, specialists mentioned:

- An intentional exchange of information, clear and easy to understand
- The child is initiating interaction
- Communication takes place according to the child`s interest
- The child is motivated.

In the PECS protocol strategies of specific prompting and reinforcement are used and systematic error correction procedures to promote learning if an error occurs.

PECS (The Picture Exchange Communication System ® (PECS®) is an evidence-based programme, a successful programme, in the context of assuring and respecting the protocol of the method. For a successful implementation of PECS, there are certified PECS Consultants all over the world, who realize a programme of certification and training. https://www.pyramidonlinelearning.com/moodle/course/index.php?categoryid=15). PECS certification programme is offered to the specialist to validate knowledge, working and practical skills regarding implementation of PECS methodology. People who are trained for all the levels of training and professional development, will become Certified PECS Consultant or PECS manager. For UK the information can be obtained at https://pecs-unitedkingdom.com/about-us/.

III.12. Sign language

Definition: Sign Language (SL) is formed by visual and dimensional actions using a person's hands, face, eyes and head as visual carriers of the message. There are significant differences between SL and spoken languages due to the way they are produced and received. SL uses visual and dynamic cues, while verbal languages use voice and hearing perception.

How it works: Languages are broadcasted and received by all individuals who understand that language whether it is verbal or signed (Sutton-Spence & Woll, 1999). When the receptive communication process is directly influenced by the cognitive potential of processing the verbal or signed input it becomes difficult to ensure the understanding of a message. All individuals can be communicators or receivers of a language because it offers feedback so that the communicator or the signing person can monitor the linguistic output, can use

interior language and can model their communication according to their preferences.

Major challenges regarding SL are usually linked to expressive features of communication. Words and signs have a specific meaning because the users have negotiated the conventional connotations. In SL even though some of the signs aren't totally arbitrary, the meaning is always conventional (Tufar, 2012).

Each sign consists of a specific hand conformation, a series of movements and a location.

Benefits: Sign language is transmitted to deaf or hearing-impaired children in a cultural context, so they acquire the language concepts in close connection with the characteristics of the group they belong to.

Sign language allows deaf or hearing-impaired children to participate in full to every activity in their personal, educational or social setting.

Remember!

– It is vital to know the specific features of communication regarding the child you are working with and to use signs consistently.
– Hearing impaired and deaf children may use signs and gestures even if their hearing parents don't sign. It was proven that they communicate in that way as a natural and hereditary need to communicate.
– Sign language as a linguistic system is learned properly from other sign language users.
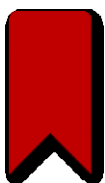
TACTILE SIGN LANGUAGE

Definition: Tactile Sign Language (TSL) is a form of communication like Sign Language, that is used by deaf-blind individuals and consists of hand configurations using only the tactile perception for expressing and receiving a message.

While hearing children are exposed to a multitude of words before they begin to talk, children who are deafblind need extensive knowledge and practice with

objects, signs and other symbols during natural, everyday situations before they can comprehend their meaning (Downing, 2003).

TSL is composed of four important parts:
  – Configuration of the hand,
  – Position,
  – Movement,
  – Orientation.

How it works: Although there are similarities between Sign Language and Tactile Sign Language, the latter is linguistically unique. SL is based on hand configurations plus facial expressions and eye movements (Chen & Downing, 2006). When using TSL the parameters are changed. TSL is simplified in comparison to SL and has higher coherence. The deaf-blind partner needs information on the surrounding environment, the number of people present, the setting, the emotional state of people in the room/ area. There are some of the sign that need to be less expensive than when using SL, so they can be perceived by deaf-blind partners.

Children who are deafblind need a variety of communication options. Communication systems are built on natural social interactions and dialogs through symbolic and no symbolic means (Chen, 2001, cited by Tufar, 2012)

All signs that usually need lipreading backup, so they are distinguished from other signs with similar hand configuration, must be now executed in a such a way that their meaning is clear. Hence it is important to learn and perform accurately the TSL.

There are specific positions for the hands when having a monologue or a dialogue: in a monologue the hands of the receiver are positioned over the hands of the communicator, while in a dialogue the hands are situated in an asymmetrical position: the active hand of each partner is put above the receiving hand of the other partner – advantage: they don't have to change the position of the hands.

Benefits:

  – TSL is a method that allows deaf-blind people to give and receive information about their environment;
  – It is a sensory approach;

- Helps the child to anticipate familiar actions;
- Supports the child in the learning process;
- Increases opportunities for social interaction;
- Directs the child's attention to the ongoing activity;
- Supports participation in activities;
- Gives meaning to activities;
- Supports receptive and expressive communication;
- Encourages caring and planned interaction with the child;
- Increases observations, remarks and replies to the child;
- Endorses an expectation of the child's answer;
- Supports communication that is accessible to the child;
- Autonomy, equity, and access for Deafblind people;
- Access to direct communication and shared language;
- Access to language is a key value of the Deafblind community.
- With the development of more standardized and unique structural and social aspects of language, interpreters and interpreter educators could become educated on the current standards so they get accurate and comprehensible output when working with consumers who use Tactile Sign Language.
- For an effective work, interpreters of Tactile Sign Language must have a full understanding of language structure and Deaf-blind culture. To integrate these aspects into interpreting work they must be actively involved in the Deaf-blind community.
- As the language gains more extensive recognition, education and qualification standards for interpreters must develop to reflect the competencies required to work in this active and developing community.
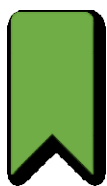
Remember!

- Backchanneling is the feedback given for understanding the message and it consists in (Radin, 2007):
    o Repeated taps with one finger on the backhand of the partner – the feedback is defined by the number, speed or intensity of the taps.
    o Pressure taps on the partner's hand to ensure understanding of the message.

Module III

- The question mark sign needs to be executed before the question itself, so the deaf-blind person is prepared for it. Sometimes for the accuracy of the message, the question mark sign needs to be executed both before and after the message.
- When signing to a person with good visual acuity, but a small visual field, it is necessary to adapt the distance so that all the signs are included in their visual field.
- Backchannelling ensures receptive and expressive communication.
- The use of objects, tangible symbols, textured symbols and signs should meet the communication needs of the child and increase their body language and other means of expression.
- When interacting with a deaf-blind child:
    o Assess the child's preferences and use those actions or objects in your interaction and in your development of conversations.
    o Observe how the child responds to being touched and use the type of touch that is the least intrusive.
    o Allow the child to process information and observe the child for an anticipatory response. Wait longer than you might for a child of the same age who is not disabled.
    o Attend to, interpret, and respond immediately to the child's communicative behaviors.
    o Allow the child to respond using the most resourceful means for them: pointing, touching a symbol, giving you a symbol (Tufar, 2012).
    o Use tactile communication regularly and constantly with the child during daily meaningful and age-appropriate activities and across home, school, and community settings.
    o Identify situations that motivate the child's communication behavior and in which tactile communication will be used consistently.

Interpreter training must include education on the current language practices of the Deafblind community so that interpreters who work with members of the community who use Tactile Sign Language will be fully equipped to produce accurate language.

- Interpreters must realize the differences between Visual Sign Language and Tactile Sign Language to make informed decisions regarding the jobs that they take and the qualifications that they want to pursue.
- It is important to encourage a partnership between interpreters and the Deafblind community to keep up with the rapid changes in the language and

community and ensure that teaching practices remain culturally and linguistically relevant.

– Cultural awareness and linguistic competence are two critical components of meaning transfer, and these distinct aspects of Tactile Sign Language call for a distinct skill set in interpreters who work within the Deafblind community.

– The professional training of new and practicing interpreters must focus on what it takes to be qualified to interpret into Tactile Sign Language. Training must include specific linguistic exposure to develop their skills in Tactile Sign Language as a language system independent of Visual Sign Language.

# III.13. The SCERTS Model (Social Communication, Emotional Regulation and Transactional Support)

The SCERTS Model is a multidisciplinary approach, initially projected for children with ASD, but which can be used also for other groups of children with severe communication problems. Many studies are focused on the development of social communication abilities and emotional regulation as predictors of language acquisition, adaptive social functioning and school success (Prizant & al., 2005).

This model includes an evaluation form based on the curriculum and the individual progress is assessed in ecological contexts with different partners and in different situations. The objectives are therefore established for the child with communication disorders, as well as for his social partners, who are trying to stimulate language, social behavior and active implication in the communication process (Crişan, 2012).

SCERTS Model is recognized as a challenge for the approach of complex relationships between the acquisition of communication abilities, of some socio-emotional factors (emotional regulation, development of relations) and types of transactional supports, which predicts real progress in the communication and social area as mentioned in a study of Prizant et al. (2003).

Generally, the objectives are adapted to daily routines and to the communication style of each child. The main components of the model are:

1) Social communication
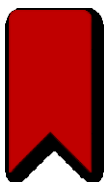2) Emotional regulation
3) Transactional support.
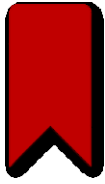
Social communication (SC) can be impaired because of different problems concerning joint attention, the ability of anticipating intentions and the emotional disposition of the partners, aspects that generate a limited ability of understanding and using non-verbal communication, language and respecting social conventions regarding conversations. SCERTS Model considers the development level of the child.

Therefore, *the stage of the social partner* fits children at the presymbolic level, who use gesture as main method of establishing joint attention and use objects to understand other's intentions.

The second *stage* is the one *of the language partners* which fits individuals who use symbolic language, as main communication method and who are in the period of developing vocabulary.

The last *stage*, the one *of the conversation partners* fits the children who use speech at a conversation level, being aware of other's social perspectives and of social conventions.

Consequently, as mentioned in a study (Rubin et al., 2009), the aims of the intervention are established according to the stage in which the child is situated, according to his potential, his functional needs, his family priorities and the social conditions.

Emotional regulation (ER) is the second component of SCERTS model. If we consider children who are misinterpreting and cannot participate in social events, intervention in this area is very important. These deficits can determine a very high level of social anxiety in these children and they tend to avoid social contexts. As for the first component, for emotional regulation the model includes some educational objectives which are, for the first stage:
– Mutual regulation;
– Expressing joy or anger;
– Changing negative disposition when receiving affection from others;
– Self-regulation;
– Observing persons or objects from the environment;

- Using behavioral strategies for the regulation of activation state during social interactions;
- Avoiding overstimulation or unwanted activities.

For the language partner stage, the objectives are:
- Mutual regulation;
- Understanding and using symbols to suppress emotions;
- Choosing between options when partners are providing occasions;
- Using language strategies to ask for a break;
- Using language strategies for asking an activity or for giving a functional answer for emotional regulation;
- Using behavioral strategies for the regulation of the activation level (through modelling) ;
- Using language strategies for the engagement in long lasting activities;
- Using language strategies to recover from a serious emotional breakdown.

The last stage supposes the development of more complex behaviors, such as:
- Understanding and using words which designate different emotional states to express emotions;
- Collaborating with peers in problem solving;
- Asking for help in conflict solving;
- Showing the ability to inhibit actions and behaviors;
- Using self-monitoring and self-motivation for tasks in behavioral guidance;
- Identification and reflecting about strategies which support emotional regulation;
- Using planning and evaluation to regulate activation during new activities and during possible changes.
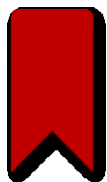
Transactional support (TS) was meant to offer an instrument for measuring behaviors in the communication partners and for ensuring progress in intervention for different partners. Several studies are focused on the efficiency of alternative and augmentative communication in expressive language stimulation, in understanding language and behavior, in expressing emotions and regulating emotions (Prizant & al., 2005). As Crişan (2012) mentions, during the evaluation process, information can be obtained according to the measure in which AAC supports are present. Therefore, this component

> of the model concerns the modifications of the environment and the fact that AAC contributes to the development of different aspects of language, including understanding, expression and anticipation of social partners' actions.

To conceive and to apply a comprehensive educational program for children with MDVI, some major objectives regarding interpersonal support for social partners are proposed by Prizant et. al. (2005):

1) The partner is receptive for the child (he answers to the signals that are significant for the development of communication and recognizes signs of emotional problems, offering support)
2) The partner stimulates initiating interactions
3) The partner respects individual autonomy (allows the child to solve a problem in his own time and way).
4) The partner provides opportunities for the interaction engagement (uses a proper nonverbal behavior to encourage interaction).
5) The partner offers support according to the stage of development in which the child is situated.
6) The partner adapts his language (according to the stage of development).
7) The partner is modelling good behaviors (for example, when the child has a bad behavior).

The same authors are proposing also some objectives concerning the learning supports:

a) The partner structures the activity to encourage active participation.
b) The partner uses augmentative communication as a support for developing communication abilities.
c) The partner uses visual supports (for the description of sequences and of time needed for the activities).
d) The partner modifies the objectives, the activities and the learning environment according to each child's style and abilities.

III.14. Speech development

List of techniques and methods used for the development of speech

1. **Making sentences**
   – Making sentences with the help of concrete objects, pictures, real actions, given words or structured patterns.
   – It can be a playing activity, thus enjoyable especially if you use children's favorite objects/ items.

– By using their preferred items, children are tempted to make more sentences and the teacher will correct and adjust them.

2. Unfinished stories

– During this activity the teacher will stop a certain story in a moment of tension and the students will be asked to propose solutions for the ending of the story.

– Attention and caution are advised for children with autistic spectrum disorder because their anticipation skills are limited. Nevertheless, the method can be used if you are asking support questions along the way.

3. Reporting daily events

– This kind of telling must be stimulated by showing an interest to whatever spontaneous personal events the children are talking about (family life, something they have seen from their car on the way to school, etc.).

– Even though these moments can be rare for some MDVI children, their communication must be carefully received without correcting the messages at first.

– Only in the later interventions or in older children will we insist upon logical and grammar structure.

4. Using natural gestures and body language

– Children usually discover natural gestures and body language even before speech. The gestures give meaning to abstract or unknown words. They are using the child's body and they work by imitation and modelling. The gestures can be refined in amplitude, intensity or emotion.

– Demonstrating gestures and using them to express needs, emotions or moods can be of real help in the processes of communication, learning and social interaction. Understanding the gestures and their importance and role in social interaction is a continuous objective for the teacher of MDVI children.

5. Including total communication in the classroom

– Total communication represents a system that successfully integrates listening, speech reading, speech, body language, sign language and active reading.

– The purpose of this process called total communication is to develop for each student a comprehensive communication system that will allow him/her to get fully involved in all the academically and social areas and branches.

- Total communication represents more than the simultaneous use of sign and spoken language. It represents teaching students to use their residual hearing to acquire the spoken language, the information given by the teacher and those provided by the environment.
- Total communication translates in educating the children in such a manner that they can make logical connections between what they think they've heard, using the visual information by lip-reading and signs, and the existing gaps in the given requirements or tests.
- Total communication requires daily activities of auditory training and listening techniques within every academic classroom interaction.
- Total communication also means providing a consistent, functional and professional acoustical amplification. It is imperative for the audiologist to be a part of the hearing-impaired classroom team (McFadden, 1999, cited by Serban, 2016)**.**

6. **Using visually adapted semantic networks**
   - A semantic network represents a graphical notation for the representation of knowledge as a pattern of interconnected concepts.
   - All semantic networks have a declarative graphical representation that can be used either for the representation of knowledge or for the automatic support systems. Some are strictly informal, while others are officially defined as logical systems.
   - The steps of a semantic network are as follows: writing the main word in the middle of the blackboard/page, writing the words that come to mind about that, drawing lines between the words that connect in any way.
   - The visually adapted semantic networks are built with pictures and words.
   - Here you have an example of how you can build a semantic network with pictures. (Serban, 2016)

Exercise

Objective: to identify a model of interaction with a deaf-blind child through TSL.

Time: 15 - 20 minutes

Method: Greet the child by touching the back of his or her hand or shoulder. Present yourself by your name, name sign, symbol, or identification cue. Pause and wait for the child's response. Keep a connection with the child by sitting where you can see the child's responses and are available as a communication

partner. Offer your hands to the child: under the child's hands so the child can hold your fingers or get your attention. Or place your hand near or slightly underneath the child's hand(s).

Encourage the child to explore the environment through touch: to observe materials on a desk, to feel your own hands while involved in other activities, to study the actions of others.

Place your hands beneath the child's hands as you explore together.

Encourage a diversity of communicative purposes: invite, reject, suggestion, comment and being followed in the conversation.

Participate in "tactile conversations" about different objects by touching them together with the child.

When a conversation or an activity ends, sign FINISH and tactilely model for the child how to put objects in a finish box or push them away.

Before leaving the child, part with them by using a goodbye gesture: wave, touch cue on the shoulder and ask the child to share this sign with you.

Questions:

– How difficult was the exercise?
– How did you feel as a communication partner using TSL?
– How difficult was it to convey a message and to be understood?
– What is in your opinion the main purpose of the exercise?

III.15. Communication environment

The development of communication is related to the context in which the intervention takes place. Good practices in communication intervention refer to the milieu approach. The Milieu Approach aims at developing communication within natural and functional activities over a day, in contrast to individual intervention activities, planned and conducted in isolation from a classroom context, in a cabinet. One of the

disadvantages mentioned in this approach is to reduce the possibility of assessing the level of implementation of the communication intervention program for each child. At the same time, it seems that the style of interaction of the teaching staff greatly affects the quality of this intervention. Consideration will also be given to aspects of functional sensory debris and perceived skills, awareness and exploration of the environment, which may lead to the following behaviors: children do not interact spontaneously, dialogue is initiated and even completed by the adult, and second, the use of complex communication systems places other requirements on the communicating adult (Rowland et al., 1995).

Communication is strongly dependent on the opportunities created and provided by the adult, and refers to communication pointers (visuals: signs, gestures, auditive: speech, eating the table, tactile: touching), pre-symbolic and symbolic communication. Rowland et al. have identified eight major contexts in which these interactions take place: table service activities, personal hygiene, mass group activities, language development scheduling sessions, general motricity activities, transition periods between activities, before day class ends and solitaire games. In achieving an environment rich in communication opportunities, we must consider three aspects: space, people and time.

Exercise:

Describe the communication competences that you think a specialist / professional/ intervener should develop to facilitate and support communication with children with MDVI.

Important

This give another argument for developing competences in teachers as being observers of the child's communication intentions, analyses the functions of the communication, give the proper reinforcements so that the child understands that his/her intentions are understood and responded to. Only when the child realizes that his communication can make a difference within the environment, and he can determine modifications through communication, changes in information, communication, behavior and attitude, he will tend to use his

III.16. Assistive technologies and individuals with visual impairments and multiple disabilities

Interpersonal communication embraces various forms and techniques. The communication message – forwarding, encoding, receiving and decoding – raises some issues that are widely studied and analyzed by scientists and practitioners from different fields. If we think about techniques meant to facilitate communication, we can find a lot of examples, but in this module, we will focus on developing communication for a specific group by using specific technologies, assistive technologies. First, the target group is students with multiple disabilities - hearing and vision, and the second aspect which will be discussed theoretically and practically within this module, is about assistive technologies.

The module contains general information about the main applications, educational resources, and exercises that can create specific materials to develop communication and improve education for children, pupils and adolescents with multiple disabilities by using assistive technologies.

We can find a great variety of devices and applications, which makes our effort a little bit difficult, but our common interest will concern the evaluation of needs, the guidelines for an identification of the most effective assistive technologies and of course, individual exercises and different groups activities.

In the same time, we must not forget that using assistive devices requires an environment that is accessible for self-employment, that is building and supporting an educational environment based on the principles of **Universal Design (UD), Design for All (DfA)** and **Universal Design for Learning (UDL).** In this part of the course we will not discuss issues about environmental accessibility, but we will present these during face-to-face or online meetings.

Please read the following online materials:

- Universal Design Principles from Centre for Excellence in Universal Design (www.universaldesign.ie)
- Universal Design for Learning Principles from CAST (www.cast.org).
- Design for All Principal from DfA Foundation (www.designforall.org)
- Recommendation from Individuals with Disabilities Education Act IDEA (www.sites.ed.gov/idea/)

Materials required for practical activities: laptop and / or tablet, smart phone, thick paper, glue, colored pencils, sticks and lots of imagination.

III.16.1. Types of assistive equipment

Bugaj and Norton-Darr (2010, apud Pădure, 2015) present the main services for individuals with disabilities involving the use of assistive technologies:

- evaluating the needs of the individual with disabilities, including a functional evaluation in the regular environment;
- acquiring the assistive equipment;
- selecting, designing, installing, adapting, maintaining, repairing or replacing the assistive equipment;
- coordinating and using other therapies, special methods or services involving assistive devices, connected to the curricula and to the personalized intervention programs;
- providing, counseling, supporting and training for the person with disabilities and his family;
- training and helping for specialists interacting with people with disabilities.

The coverage area of the assistive equipment can be categorized from non-tech equipment, such as the pencil holder to keep it as easy to grasp as possible and to catch the fingers by the person with disabilities to high-tech devices which allow

you to control the computers with the voice or some common devices in the environment.

To get a better understanding of the main categories of equipment that can be used for the assessment, for the intervention and for communication with people with multiple disabilities, Dell et al. (2008, apud Pădure, 2015) define three levels of technology of the assistive devices, from the simplest to the most complex, from the non-technological devices to high-tech, for example:

– non-tech devices:
  o support for pencil gripping
  o pens, pencils, colored markers
  o piece of paper or squares
  o reading guide
  o sloping table
  o paper / notebook stands
  o anti-slip surface
  o magnetic letter, tactile letters
  o magnifying
  o rubber stamp
  o layout and tactile figurines
  o device for handling various objects in the kitchen
  o wheelchair

– low-tech devices:
  o digital voice recorder
  o office computer
  o electronic dictionary
  o electronic agenda
  o audio book
  o music player
  o special office lamp or for the book
  o augmentative communication device
  o key or light detector
  o speaker weighing
  o acoustic indicator for liquids

– high-tech devices:
  o personal computer
  o portable computer
  o tablet
  o mobile phone
  o application for portable devices and computers
  o alternative data input devices (input)

- alternative device for receiving messages
- internet
- communication, manipulation and alternative communication devices
- devices for localization and mobility

Please read the following online materials:

The World Health Organization (WHO, 2016) using a global survey, has completed a ranking of assistive devices and technologies for people with different types of disability. The results suggest very interesting aspects for promoting the social, educational, cultural and professional inclusion of individuals with disabilities using different assistive devices. The questionnaire was translated into 52 languages, and 10208 individuals from 161 countries participated in the study.

Application

Analyze the list of 50 priority assistive technologies from The World Health Organization study and group them according to the communication needs of individuals with multiple disabilities.

III.16.2. Graphics and tactile images

Tactile images are an important resource in educational activities with different types of disabilities, especially for blind individuals, for those with multiple disabilities and with low vision. Tactile images contribute to a better understanding and representation of an object at the cognitive level, but also facilitate the cognitive stimulation through touch.

In many contexts, tactile graphics are not accessible for students due to several reasons:

- they are created with many unnecessary details that are very difficult to integrate in the process of tactile exploration and automatically the individual cannot adequately understand the image;
- the incorrect use of labeling by ignoring standard labels and dimensions of Braille points;
- a lack of an adequate teaching method for the user in the process of tactile exploration of images;
- tactile images may seem relatively simple to create, but the images must be different for children and adults, because there are different ways of exploring and understanding the global tactile images components; it is the difference between beginners and experts;
- in the process of construction of the tactile images we must take into consideration the way they will be reproduced, an image made by swelling cannot be used all the times with a Braille printer.

III.16.2.1. Tactile graphics

These are graphics with shapes and components made of succession points or embossed continuous lines. There are multiple solutions and various applications for making such tactile images. These tactile images can be made manually using the Braille printer, three-dimensional - with a 3D printer, displayed in real-time on a Braille display, visual-tactile graphic by fuse on paper or plastic.

III.16.2.2. Handmade tactile images

In many situations, this solution is used to create tactile materials for children, for geometry classes or early interventions activities. We can use flexible, colorful sticks, which can be pressed together to one another or various surfaces to make multicolored tactile designs. An example could be Neon Wikki Stix (www.wikkistix.com) which are made of wax and fiber, are durable and easy to use because if the drawing is not correct, the sticks can be easily removed and repositioned so that the exercise can be resumed.
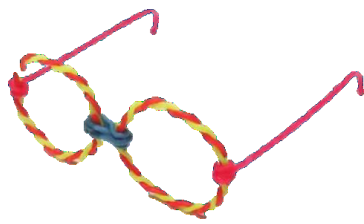
www.engagingminds.ca   www.kitplanete.ca   www.wikkistix.com

The disadvantage of tactile images made with these sticks is that the final models cannot be kept for a longer period or requires a large storage space for all of them. The tactile images can be used in classroom educational activities, in sensory stimulating therapeutic activities, but also for recreational activities with blind and partially sighted children after 3 years of age.

One other solution is to use Tactile-Mark, a liquid plastic that strengthens when in contact with the air. It is recommended to make bookmarks on the home appliance buttons, to write letters, numbers, but also to draw out various images. The solution can be applied on clothes, paper, metal or hard plastic. Once applied, the substance hardens in about 2 hours.

Tacti-mark comes as a liquid which when dry forms a raised three-dimensional colored mark. It is an excellent product to be used as a marking tool or to be used as a teaching aid for writing letters, numbers, drawing pictures or outlining maps. You can make short, thick lines, dots or other shapes.

A common solution to create live tactile images directly by the students is to use a beige rubber or a special holder on which a plastic sheet is placed, and at the tip of a pen or a toothed wheel, images can be made tactile. Also, you can use an eraser flattens tactile to delete lines.

www.easytactilegraphics.com   www.anjo.ro   www.rnib.org.uk

To create tactile images, we can think of a lot of materials and tools commonly used in school: wooden / plastic sticks, glue, paper of different types and textures,

multiple accessories. In this process of creating tactile images we need a good knowledge of the children's or adolescents' specificities and needs.

III.16.2.3. Braille embosser

The principle behind Braille printers is punching points on paper, resulting in a Braille text page or graphics with lines or curves made of dots. Models of Braille embossers are multiple, from printers that embosses only in relief to printers that alternately print classic texts, colors, and different body textures. Not all printers available on the market can print tactile images, but they all print Braille text. Dedicated or complementary applications are required to create tactile images. Among the most used for printing and creating graphics are Tactile View (www.tactileview.com) and Duxbury (www.duxburysystems.com). The View Plus Company offers a very exciting alternative for rendering tactile reliefs and colorful textures very useful in special and inclusive schools (www.viewplus.com).

Please read the following online materials:

On the Index Braille web site, on section dedicated to the Braille embosser, you will find Competitor comparison. To compare different types of Braille printers you can chose and read more about them regarding performance, print size, paper type, speed, dpi, etc. (www.indexbraille.com).

III.16.2.4. Touch images by fuse

Perhaps the most modern and easy way to create tactile imaging solution is the use of heat-generating equipment and a special micro-capsule paper printed on a laser printer. When black ink containing enough carbon is printed on the paper and passed through a heat fuser, the black ink absorbs the heat causing the microcapsule surface to swell. Be careful, only black ink, not color one will swell, the rest of the paper and all the colors remain smooth. Special cardboard for manual drawing can also be used, and the final touch image process consists in passing the

paper through the equipment. The process is the same - as soon as it passes through the machine and reacts with the heat, the black ink will "swell". This way you can easily create maps, pictures, symbols, graphs, labels, route maps, building layouts.

Compared with tactile images create with an embosser, the graphics created by fuse need to be processed, and the Braille labels must be drawn from the outset in graphic form and printers and black ones. Thus, we can achieve tactile images for both the blind and the visually impaired, for various activities and different educational situations.

Through this method we can create tactile images with different textures and labels to facilitate access to information for the blind students. Even though the print quality and tactile image quality seems more interesting and easier than using an embosser, we must be careful not to abuse with graphics elements and we must pay attention to standards guide lines to have efficiency in tactile exploring.

Tactile image example creates using guide lines and tactile images create different, both in Braille and fuse printing.
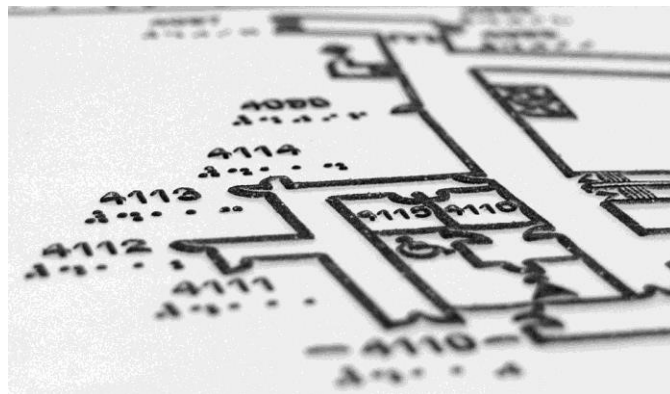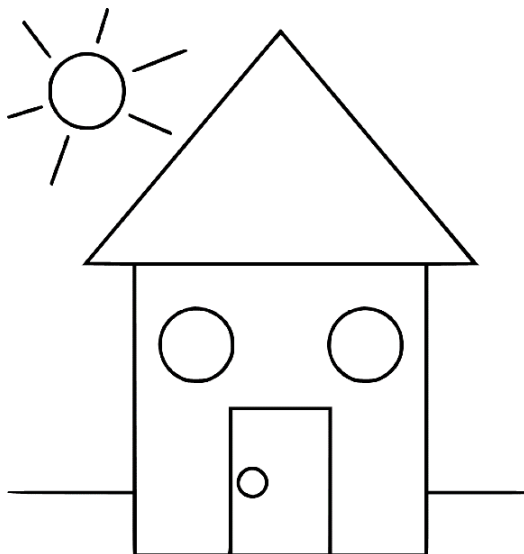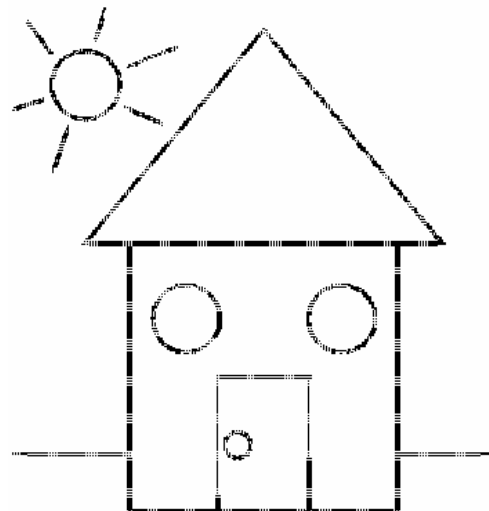

Made by the using swell method.

It is recommended to be made by the fuse.

It is not recommended to be printed with Braille embosser.

It is recommended to be made by the fuse.

It can be recommended to be printed with Braille embosser.

Some essential recommendations for making tactile images using swell:
– use only original laser toner printers
– use the same type and size font in Braille - there are special Braille fonts for different operating systems;
– use areas that need to be swollen only pure black and less shades of gray or colors;
– to create different textures, use different shapes of lines, points, geometric shapes etc.

Module III

III.16.2.5. 3D printers

Although 3D printers involve recent technology, they became very popular, therefore today we can find them in hypermarkets at very good prices. Consumable - plastic - is relatively affordable with a wide range of colors and categories. Making 3D materials is a very accessible solution for teachers who work with students with visual impairments because they can offer them the opportunity to produce simple or complex educational models/materials meant for the different classes' topics. Creating 3D models requires a great knowledge in graphics and this aspect could be frustrating for many teachers. So, we thought it would be very useful to provide a list of websites where 3D models can be downloaded for free.

www.thingiverse.com

For free 3D object collections, check out these websites:

- www.3delicious.net
- www.3dmodelfree.com
- www.3dsky.org/3dmodels/
- www.all3dfree.net
- www.archive3d.net
- www.cadnav.com/3d-models/
- www.cgtrader.com/free-3d-models
- www.craftsmanspace.com/free-3d-models
- www.cults3d.com

- www.free3d.com/3d-models/
- www.free-3d-models.com
- www.grabcad.com/library
- www.myminifactory.com
- www.sketchup.com
- www.thingiverse.com
- www.turbosquid.com

Application

– Identify two other collections of 3D models and share them with your colleagues using a collaborative document.
– Split in groups of 3 persons, choose two different topics of the student's classes and find in the collection five 3D models. Every group must have different topics.

Creating tactile images is a complex process that requires a lot of creativity. Tactile images and graphics can be conceived through various methods, either handmade and/or using technological equipment. Therefore, it is important to have a very good knowledge of the standard guide lines in the field in order to obtain clear and understandable tactile images for the blind individuals.

Application

1. Make a set of 5 tactile images for a student with multiple disabilities (low vision, audible loss 40%) for studying marine animals. This application can be made in group or individual.
2. We know that many students with visual impairment encounter difficulties in different subjects in public schools. Choose an image for the following subjects and try to redesign them so that these images can then be printed using a Braille printer and fuse. The topics are: anatomy, geography, geometry.
3. Develop a tactile map for a student with multiple disabilities from your school. The route should include the entry into the building and labels to guide the student to his classroom or to one of the therapy rooms and to the toilet.
4. Choose three pictures from cartoons with a very famous character, process them, save only the margins and fuse. Give

Please read the following online materials:

– Creating Tactile Graphics: Using Layers in Paint.net – www.learninghub.royalblind.org
– On editing graphics for the blind - www.heardutchhere.net/grbl/grbl0.html
– Guidelines and Standards for Tactile Graphics - www.brailleauthority.org/tg/web-manual/

III.16.3. Making audio accessible educational materials

After the invention of the Braille writing system, audio recordings were an important step for increasing access to information for all the individuals with disabilities. Along with tactile images, audio is an effective way of access to educational and cultural information, regardless the level of education and age.

III.16.3.1. Daisy formats

The DAISY standard reproduces the content of a printed material, such as a novel, a dictionary, or a magazine, in a digital format for the blind and learning disabilities students. The Daisy format consists of a collection of files of several types, on CD or in an electronic form (Pădure, 2008).

A book in Daisy format can be selectively listened to, just like a printed book. Using a device like a CD player or computer with voice synthesis or a dedicated playback software, the student can jump to a specific page, skip from a chapter to another, from one paragraph to another, resume a previous sentence may skip the footnotes.

The DAISY format provides search and synchronization features of the printed text with the spoken text.

The use of the Daisy format has an important role in the accessibility of technical books, textbooks and university lectures for the blind and learning disabilities students.

There are three types of Daisy books: (1) Daisy audio - includes only material recorded in audio with a human or synthetic voice; (2) Daisy audio and text - includes the pre-recorded audio material, synchronized with the electronic text that can be read on the screen during playback; (3) Daisy text - electronic structured format according to the Daisy standards and played on a computer with a pre-installed synthetic voice.

For more information about Daisy players visit www.daisy.org.

–   iOS - Read2Go, Voice Dream Reader
–   Android - Darwin Reader for Android, GoRead
–   Software Players - AMIS, ReadHear PC, Book Wizard Reader, EasyReader
–   Hardware Players - Victor Reader Stratus, PLEXTALK, PTN 2

III.16.3.2. Online accessible documents using RoboBraille

There are interesting and easy solutions to create accessible audio texts, much easier for teachers, parents and students. These solutions reduce the amount of time we can spend on making audio with human voice in the studio, but we can use synthetic voices that make texts and electronic information clear. Some of the examples are: standalone software, commercial or freeware such as Textaloud, Balabolka, Expressivo, Speech2Text, etc., but also online solutions, RoboBraille platform.

RoboBraille can be a complementary solution to current systems and services for accessing information for users with visual impairments and learning disabilities. RoboBraille is invented and developed by Synscenter Refsnaes (The National Center for Visually Impaired Children and Youth in Denmark) and Sensus ApS Denmark. RoboBraille offers full and automatic text conversion in various alternative formats including MP3, DAISY text and audio files, e-book and Braille and is a service available in several languages (Arabic, Bulgarian, Czech, Danish, English / British, Finnish, French, German, Greek, Greenlandic,

Module III

Icelandic, Italian, Lithuanian, Hungarian, Norwegian, Dutch, Polish, Portuguese, Romanian, Russian, Slovak, Spanish and Swedish) (Christensen & Pădure, 2014). Using the web interface, the user can upload a file in PDF document, image or others format and he can select the format he needs, and the server will convert the uploaded file and send an email to the user with the result.

To convert a document, users will have to go through four simple and easy steps:
1. selecting and uploading a document
    1. you can upload current type files - DOC, .DOCX, .PDF, .PPT, .PPTX, .TXT, .XML, .HTML, .HTM, .RTF, .EPUB, .MOBI, .TIFF, .TIF, .GIF, .JPG, .JPEG, .BMP, .PNG, .PCX, .DCX, .J2K, .JP2, .JPX, .DJV and .ASC
    2. web address of a page or link to an online text document
    3. a simple text written directly on the site
2. Specify the type of conversion
    a. MP3 audio
    b. DAISY full text and audio
    c. DAISY Math full text and audio
    d. Braille
    e. E-book
    f. Accessibility conversion
3. Depending on the format you want to step in, the specifications in step 3 may be different:
    a. MP3 audio - specify the language of your document and speed of speech.
    b. DAISY full text and audio - specify the language
    c. DAISY Math full text and audio - specify the language
    d. Braille - specify the natural language of your document, requested contraction level and target format of the Braille document.
    e. E-book - Specify the target format of your e-book (Epub, epu3 with media overlay, mobi - Kindle)
    f. Accessibility conversion - Specify the target format of the conversion (txt or pdf)
    4. Enter an email address where the result of the processing will be transmitted.
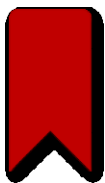
Important to know:

- you must always choose the processing language according to your original text;
- the platform can convert images or pdf files into accessible format using optical character recognizer;

- sometimes files converted from pdf to document require cleaning the text, this aspect depending on the complexity of the converted material;
- you can upload multiple files at the same time to been converted;
- conversions cannot be used for commercial purposes;
- the platform does not retain personal data and files of those who use the service for free.

Application:

To familiarize yourself with RoboBraille facilities, convert three simple audio documents and convert five PDF files and text image into accessible materials.

III.16.4. Other ways and methods to facilitate communication

Creating accessible materials for students with multiple disabilities is a simple or hard process, depending on creativity, time, motivation and good educational methods. We cannot have a unique method, but to combine different methods, materials and techniques to have extraordinary educational materials and good results for individuals with disabilities.

Many times, the students have difficulties in accessing the texts. The teachers have problems to understand the needs and the accessibility of information - how big the font must be, what type of font should be used, how do we need to arrange the text to make him readable, etc.

We will just give you some simple recommendations and many models and techniques you will discuss with your trainers.

Among the most commonly used and recommended fonts are Arial, Tahoma, Sans Serif, Verdana, Helvetica, Calibri, APHont, Comic Sans, OpenDyslexic and the minimum size of the fonts to discuss about accessibility is from 18 points. It is often necessary to use spacing between rows of at least 1,5 to facilitate reading and to alignment to the left the text, to avoid the wide spaces between the words. Often,

Module III

visual contrast is ignored, so our recommendation is to use an as efficient contrast as possible to facilitate reading the document. We recommend looking on W3 guide lines for effective contrast. Another problem concerns the images and graphics that should be delimited by the background and overlay with text, to facilitate reading without barriers.

Please read the following online materials:

Guide lines choosing effective contrast: www.w3.org/TR/low-vision-needs/

Application:

Choose two recent articles from a newspaper web site and make them accessible for a student with multiple disabilities. Be careful with images and features text.

There are multiple ways to communicate with persons with different multiple disabilities by using images. We can use a classic communication with printed images, organized by domains and activities. Or we can use mobile apps or software on the computer. We identified one of the most popular applications using special education and inclusive classes is the Grid. The Grid empowers people with disabilities to communicate, control their environment and access their computer.

Please read the following online materials:

Look on the Learning Resources section for guides and resources to help you to learn, teach and play with The Grid - www.thinksmartbox.com .

Application:

Download the Grid 3 application on your computer and make a scenario for a person with multiple disabilities with the theme "Daily School Activities." Link to download: www.thinksmartbox.com/download-grid-3

Application:

Find five mobile applications, that can be used by or with persons with multiple disabilities on different type of activities. Each participant will need to provide a presentation for one of the five identified applications in AppStore or GooglePlay.

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