14534 KARAKTER

THE SYSTEM APPROACH TO TEACHING ORIENTATION AND MOBILITY TO INDIVIDUALS WITH VISUAL IMPAIRMENT

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Welcome ladies and gentlemen.

I started working as a rehabilitation specialist at the Rehabilitation Centre of the State Institute for the Blind in 1990, where I used to work with adults who lost their sight in adulthood. Since 2007 I have been working as an O&M (orientation and mobility) specialist, where I work with students aged 7-20.

After working with persons who lost their sight in their adult life, it was a real challenge for me how to handle the fundamental differences in teaching children with congenital blindness. In order to find answers for my methodological concerns, I started observing and analysing the perceptual and mental processes that take place when someone needs to move around and orientate without visual feedback, what sort of information, data, skills, knowledge, and methods are necessary to accomplish the different tasks in a safe and efficient manner.

On this path, I elaborated the system approach methodology of O&M.

This system must provide the efficient functioning of the following two units: orientation, which is a 'human ability or skill of defining one's actual place and position at a certain moment of time, with the help of sensory processes, via the joint mental processing of data from and characteristics of the surrounding environment , together with his or her knowledge and experience.' The second unit is mobility: 'a controlled change of position and place, taking into consideration the characteristics of the environment, together with individual skills and abilities". *(Veress, 2008).*

Considering definitions of the system approach, this is a data-processing system, because functioning requires precise and detailed data about the environment. It is goal-oriented, because it aims at carrying out all tasks mentioned above in a precise and efficient manner. It is open and adaptive, because it is in constant interaction with the environment, takes into consideration its characteristics, and adapts to its changes.

The following units of the system work in close cooperation:

Central unit, which is comprised of the following elements:

- *Processor*

  Which processes, i.e recognizes, identifies and selects all the information, gives meaning to the auditive, tactile, haptic and olphactory data, what they mean from the point of orientation, and consequently ’draws’ a mental map of the surrounding environment and defines the position and location.

- *Memory*

  Where all auditive, tactile, haptic, olphactory knowledge, mental maps of familiar environments, all objects together with their auditive, tactile, haptic, olphactory concepts, methods and techniques are stored.

- *The element responsible for decision-making*

  In the process of achieving the targetted goal, responsible for making an execution plan and monitoring action (constant feedback) by using information which is relevant to the location and position, and with the creative use of the memory (already known methods, techniques, mental maps of similar environments, implementing solutions similar to former experience).

- *Alarm system*

A special part of the central system, works in the background, automatically, needs no conscious attention, constantly monitors information arriving from the periphery, and when a piece of information processed is identical with any of the elements stored in its memory, it immediately adverts the central, decision-making part about the emergency.

The periphery and its sub-systems:

- *Information-receiver*

  Collects the most possible acoustic, tactile, haptic, olphactory data.

- *The part responsible for execution*

  Carries out the mobility plan made by the central part, and reacts promptly in case of an emergency.

In relation to the latter, it is important to underline, that it is part of a bigger ’system’, the individual, together with his/her personality. This is why its functioning is determined by all the characteristics of the person’s general and momentary mental abilities, physical and psychological traits.

Moreover, the individual has autonomy and is able to learn spontaneously. The system starts operating at the very moment of moving places, and all O&M experience improves and teaches the system. All my VI friends, who were never taught O&M and still are proficient users, confirm this.

Having all this in mind, the following are characteristic of the system approach to O&M:

First of all, we must be aware, that when we start working with a beginner (unexperienced) but already operating system, it is a complete system. The O&M specialist, who gets familiar with the particular system, its functioning and task, supports the system in achieving its highest possible efficiency by enriching its database with auditive and tactile experiences, building up a solid basis of concepts, multiplying methodological and technical knowledge, developing the whole and all its elements, modifying them if necessary.

Conscious and automatic processes are going on parallelly. A given situation determines if something becomes conscious, or stays in the background. For example, using a white cane is an automatic process, up to the point when the person needs to find a curb, so action becomes conscious. It is a severe problem if this does not performed automatically.

Baring all this in mind, the system is trained in three phases: substantial, preparatory and end phases.

During the substantial phase, the system incorporates the basic operational elements, methods and technical knowledge. The following fields are tackled:

- Body image, body concept, body schema. / Role of the system*: Identification of one's location and position in space*
- Directions/role of the system*: identification of location and position in space*
- Spatial relations/role of the system*: identification of location and position in space*
- Cognitive information/the role of the system*: filling up memory*

  The goal is to build up concepts, which are all based on real sensory experience.

  The O&M specialist must focus on enriching auditory, tactile and haptic knowledge during all phases of the training.
- Perceptual areas/role of the system*: information gathering*
  - Acoustic perception

- Defining directions

Measuring distance

- Echolocation

- Haptic perception
  - With hands
  - With soles of the feet
  - With long white cane
- Localisation of extensive objects (sensing bigger objects)
  - Beginning/end of bigger object

- Mental abilities/role of the system*: data-processing, assessment, decision-making, elaborating an execution plan, monitoring*
  - Noting differences/underlining typical characteristics
  - Noting similarities
  - Differentiating, analysing relevant and irrelevant, improving the ability to synthetize / note interrelations / noting cause-effect relationships
  - Improving attention
    - Improving perceptual attention
    - Developing shared attention
  - Improvement of short/long term memory
  - Making/using mental maps

Improvement of kinaesthetics. /role of the system*: precise implementation of the execution plan*

- Linear motion with a constant speed
- Walking up/down stairs
- Turns
- Walking distances (1-10 m)
- Methods and techniques /role of the system*: precise implementation of the execution plan*
- Use of a long white canekinaesthetics)
- Heading in directions

- Orientation indoors
- Orientation outdoors

During the preparatory phase new information is conveyed (new environments, orientation landmarks in those environments, new methods and techniques), and things the person learnt in the substantial phase are used in new combinations, in increasingly challenging O&m environments. Role of the system: multiplication of the elements stored in the memory, data processing, assessment, decision-making, making an execution plan, precise implementation, monitoring action.

Areas to develop are to be developed in more or less the following order:

O&M in the street

- O&m in cross-sections
- O&M on public transportation
- O&M in public buildings
- O&M in open spaces
- O&M and special circumstances
- Problem-solving in O&M situations

During the end phase, the independent, creative and efficient use of all the formerly acquired knowledge is performed. / Role of the system: independent practise of the system.

You have most probably noticed how disproportionate the three phases are. On the one hand, due to the time limit I cannot go into more detail in this presentation. On the other hand, the substantial phase is a mile stone, because all what comes later is based on the knowledge the person acquires during the substantial phase.

Methodological characteristics of the system approach to O&M:

All activities (perceptual, mental or motor) are built up in a systematic manner, separately from one another, component after component. This is how the parts of the system are built up, and simulation and even later real complex O&M work, can only start after each component has become a skill.

A deep understanding of how each particular component, and how the system as a whole work, help the specialist in detecting problems, finding the causes of particular difficulties, and consequently in problem-solving. The following principles must be met during the whole process, with a special focus on the substantial phase and the development of

perceptual skills:

Respect for individual skills, abilities and characteristics.

Gradual learning, i.e advancing easy to challenging, from simple to complex tasks. It is important to provide time for maturation. The principles of planning and conscious work are also important, without which we may lose control of the processes.

During the first two phases, especially in the substantial phase, lessons are modular. It means, that in each module we develop and practise a set of predefined skills. As in each individual the different skills improve differently, skill development must be under close control and requires conscious planning on part of the specialist from the very beginning. It is essential to get back to all the elements we taught during the substantial phase, and practise them from time to time, to ensure efficient inprinting and functioning.

A topic-centred approach is kept in the second phase, too. For example, O&M in cross-sections is introduced in a gradual manner, from the simple crossings we head to complex cross-sections. The modularity of teaching is broken up by these complex tasks, as the use of already known elements is needed to accomplish them. Using public transportation, for example: first, we must get at the stop, then on the bus, travel a couple of stops, get off. This is how the database of the system is filled with methods, techniques, problem-solving plans. Real situations are shown which support the individual in solving a particular problem, so the fundaments of problem-solving are set and techniques are improved.

After the first two phases (when the system is filled up with information, basic functions were built in), the client must carry out complex O&M tasks independently, in a creative and efficient way, often in unfamiliar spaces, with the O&M specialist present, but staying in the background.

The method needs further elaboration. It is already being written down in detail, and teaching it to professionals is under consideration.

This is all I can tell you in this short time about the system approach to O&M. It is all based on my observations and experience during my work. It is all theory, lacks for example neurological examinations which would analyse brain functions and the activity of the different parts of the brain during O&M. So, the system needs to be further investigated, but I am convinced that it does exist and works. However, we need further

details on the when, what and how.

I am glad to brainstorm, so fell free to share your thoughts and ideas with me. Let me remind you that so far I have been telling you about an intact, well-functioning and efficient system and the ways in which it can be improved. But what happens if the system or one of the components is injured or does not function properly? What happens, if there is a Mental disorder or after brain haemorrhage or any other deficit? How does that affect the system? Is there spontaneous compensation, if yes, how? How can we support the brain in compensating for the deficit, to function close to optimal?

The system approach may be able to give us answers for all these questions, because it examines both the system as a whole, and tries to analyse and understand even the most essential processes.

At the end of my talk, let me thank my students and colleagues: Zsuzsa Bacsáné Halász, Éva Ilona Veress, Renáta Vincze, for thinking together with me. Let me also thank my Polish teacher, Janusz Preis, who had a great impact on both my professional and private life.

Thank you for your precious attention.