Tactile audiographics
for leisure, education and employment

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"I can hear that I’ve lost my way but I don’t know where I am”

This quotation from the language of a totally blind child confirms the importance of sound for mobility, orientation and daily functioning of persons who have lost or never had eyesight.

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A map, street plan of a city or floor plan of a building are an obvious solution for sighted persons helping them find and reach places they are looking for.

Although similar solutions (tactile maps) can now be produced for blind persons, it is not always understood that for a confident use of such materials a blind person must receive training in „reading” tactile graphics. This is true not only of maps but also of both simple and complex drawings and diagrams found in course book for all school subjects.

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Some complex diagrams (as this diagram showing the lymph system of a human being) involve a large number of small details requiring additional explanation. This information usually comes as Braille labels and "guiding lines" (which a blind explorer may find confusing).

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Tactile audiographics (tactile diagrams with audio information (voice or sound effect).

Supplementing or replacing completely Braille labels and „guiding lines” with sound is a much better and more effective solution but it does not make it any easier to understand the very concept of a drawing as a 2-D representation of a 3-D reality and still requires careful introduction and training.

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Why are tactile drawings and diagrams difficult to understand for a blind person?

The main difficulty probably is that **drawings involve sighted conventions**

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A sighted person asked to draw a table will probably draw its projection - a horizontal line for the table top and two vertical lines for the legs. For a blind person these are just three lines which do not resemble a table.

A blind child’s drawing of a table shows a rectangle representing the table top and four legs extending from each corner. This drawing reflects the way in which a real table is explored manually.

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A sighted person’s drawing of a tree shows the trunk, branches and leaves.

A tree is presented in a blind child’s drawing as a circle. Asked why, the child explained: because when I put my arms around the tree, my arms make a circle.

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In a blind child’s drawing a bus is represented by just three lines: a horizontal line for the step, a vertical line for the pole the child holds onto while boarding the bus and a horizontal line for the seat.

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To help blind learners understand the relation between 3-dimensional objects and 2-dimesional drawings and to facilitate confident use of drawings and diagrams, a set of Hungry Fingers resources was developed in Poland. They help understand the concept of a drawing and introduce the learner to tactile graphics. It is made of a series of books with tactile illustrations and resources developed for explaining difficult concepts based on spatial relations. The „primer” starts with drawings of lines and geometric shapes and moves on to drawings of single objects, groups of objects and persons. Its final parts focus on introducing blind learners to the concept of a map.

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HUNGRY FINGERS books introducing children to tactile graphics (www.hungryfingers.com):
1. Shape detective 1 (Lines)
2. Shape detective 2 (Shapes)
3. Shapes detective 3 (Lines and shapes)
4. Shape detective 4 (What shapes are these?)
5. Shape detective 5 (Working with the Space Organizer)
6. Playing and Learning with Fleximan 1 – 3
7. Getting ready for maps

and a series of „Listen and touch” tactile books

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HUNGRY FINGERS resources for explaining concepts based on spatial relations (www.hungryfingers.com):

1. Transfograph – a tool for explaining the relation between objects and drawings
2. Rotograph - a tool for explaining the effects of rotation
3. Symmetrograph – a tool for explaining symmetry
4. Space organizer – a tool for explaining the relation between various geometric shapes
5. Fleximan – a magnetic stick figure representing a man helping understand drawings of people
6. Wooden magnetic teddy bear puzzle, a wooden truck with blocks – tools for explaining various spatial concepts

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Tactile graphics primer www.hungryfingers.com

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Transfograph – a Hungry Fingers invention for explaining the relation between objects and drawings. An object (e.g. a model of a table) inserted in the box reveals just an outline of the front of the table which can be compared with a tactile drawing showing just three ines – the edge (side) of the table and the two front legs.

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Whenever possible a tactile drawing should be accompanied by a real object or a model and a flat, intermediate shape representing that object. This way, introducing a drawing in three stages: exploration of an object, exploration of an intermediate shape, comparing it with the object and, finally, exploration of a drawing increases the chances that the 2-D drawing will be understood and that it will be a source of information and not a source of frustration for the blind learner.

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A wooden magnetic teddy bear puzzle can play the role of an intermediate shape between a toy teddy and a tactile drawing.

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Fleximan was developed in response to a comment made by a blind child who said: "I can understand drawings of a person if someone is standing but not if someone is doing something". It can play the role of an intermediate shape between a model of a person and a drawing.

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Stages in helping understand a drawing of a person: a model, a flat shape (Fleximan) and a tactile drawing.

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By adding sound (voice and/or sound effects) all drawings and diagrams can be made more interesting, more informative and more effective. For example, recordable labels added to this book showing various activities performed by „Fleximan” can make the stick figure speak and describe what he can do.

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A tool known as **Penfriend** (available from several suppliers) makes it possible to add recorded messages of practically indefinite length (1GB – 2GB depending on the model).

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Recordable labels can be used to add a lot of important information to maps and complex diagrams (as in this diagram showing a neuron).

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Penfriend advantages:
1. Small size and weight
2. Easy to use
3. The owner/teacher/student/parents can make the recordings
4. Voice labels can be attached to a wide range of materials
5. Can store 1GB, 2GB of recording (depending on the model)

Penfriend disadvantages:
1. Only one message can be recorded on one label
2. Messages can be read only by the pen used for recording (but there is a possibility to copy and paste messages on other pens via computer and USB port)
3. Price

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TTT- Talking Tactile Tablet (from Touch Graphics Europe)

The tablet does not require recordable labels. It can add sound to any area or point on a tactile overlay (map or diagram).

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Information about the neuron shown in this diagram can be obtained by pressing different parts of the tactile drawing.

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TTT advantages:

1. No recordable labels required
2. Dense distribution of areas or points to which recorded messages can be assigned
3. Unlimited number of levels of messages assigned to one point or area
4. Voice: natural or synthesizer
5. Preparation of materials accessible to blind persons

TTT disadvantages:

1. Size and weight
2. Special care needed in transport
3. Requires a computer or laptop
4. Time consuming preparation of audio overlays
5. Price

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The TTP is an adaptation (for the needs of blind persons) of the Livescribe Smartpen.

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Talking Tactile Pen

advantages:
1. No recordable labels required
2. Dense distribution of areas or points to which recorded messages can be assigned
3. Unlimited number of levels of messages assigned to one point or area
4. Voice: natural or synthesizer
4. Possibility to freeze a level

Talking Tactile Pen

disadvantages:
1. Price
2. Works only on commercial overlays

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Tactile audio guides to museums and art galleries is another application of the Talking Tactile Pen

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The Talking Tactile Pen is very useful in education – for audiodescribing all kinds of tactile diagrams

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Tactile graphics for mobility.

Independent mobility is a key to successful employment. (If is not enough to find a job. It is important to be able to reach the work place)

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Typical street patterns in a city (from A. Talukder SOSW w Owińskach)
Combining tactile graphics with audio information can help understand the layout of streets (from A. Talukder SOSW w Owińskach)

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Tactile audio labels can help understand and operate a particular piece of equipment both simple ...
... and complex.

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Tactile audio manuals can be used for giving detailed audio descriptions, instructions and explanations as in the case of these weaving patterns.

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It is important to remember that totally blind persons can do a lot more than sighted people are prepared to admit. All they need is being given a chance to develop their potential. And carefully introduced tactile audio graphics can be that chance!
Thank you

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Thank you

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