

Pet'ko Lyudmila
Ph.D., Associate Professor,
Dragomanov National Pedagogical University (Ukraine, Kyiv)

Repetylo Elisabeth
The Institute of Corrective Pedagogy and Psychology

BRaille SYSTEM OF TACTILE DOTS FOR BLIND PEOPLE

Abstract: This article describes and illustrates standard Braille of tactile writing systems used with individuals with blindness. The article focuses on the important of learning Braille. The authors stress that in today's high-tech digital age, blind and visually impaired individuals have dozens of highly effective options for communication.

Key words: Braille, tactile symbols, tactile writing, reading, people with blindness and visual impairments.

I. Introduction. Braille has been around for nearly 2 centuries, changing very little throughout this time. Braille, the reading and writing code currently used in the U.S. and other English speaking countries by readers with blindness and visual impairments, was invented by Louis Braille. Braille was a Frenchman who lost his sight from an eye infection caused by an accident with his father's leather working tools in childhood. Louis Braille developed his ideas for a tactile code system adapted from French soldiers who wanted to be able to read notes in the dark. Louis Braille modified this 12-dot system into 6 dots and had written in Braille and taught others by 1832. Braille was introduced in the U.S. about 1860 and was taught at the St. Louis School for the Blind and other schools [10].

II. The aim of work is to investigate theoretical material and to study researches on this theme.

III. The Results. Many professionals in work with the blind stress recorded media with blind children. Many people who become blind do so in old age and are not encouraged to spend the time and make the effort needed to develop the new reading and writing skills that depend on feeling rather than seeing. There are even Braille teachers who do not expect speed and accuracy of their blind students. As a result, the students learn Braille as a chore and a drudgery.

At The Royal Blind School in Edinburgh pupils start to learn Braille by strengthening their fingertips. Students play with items such as macaroni and peas in a tray and try to sort them using their fingertips. They then progress to learning actual Braille that is taught by their teachers, printing their own stories on Braille machines. Finally as teenagers they can progress to Braille notebooks that are a really fast and professional means of writing and transcribing Braille [9].

Braille [12] is used mainly by people who are blind, deafblind or visually impaired. It is critically important to the lives of these people as the ability to read and write in Braille opens the door to literacy, intellectual freedom, equal opportunity, and personal security. Teachers, parents and others who are not visually impaired ordinarily read Braille with their eyes.

Braille is a system of reading and writing by touch used by the blind. Braille is not a language. Rather, it is a code by which languages such as English or Spanish may be written and read. It consists of arrangements of dots which make up letters of the alphabet, numbers, and punctuation marks. The basic Braille symbol, called the Braille cell, consists of six dots arranged in the formation of a rectangle, three dots high and two across. Other symbols consist of only some of these six dots. The six dots are commonly referred to by number according to their position in the cell:

There are no different symbols for capital letters in Braille. Capitalization is accomplished by placing a dot 6 in the cell just before the letter that is capitalized. The first ten letters of the alphabet are used to make numbers. These are preceded by a number sign which is dots 3–4–5–6:

Thus, 1 is number sign a; 2 is number sign b; 10 is number sign a-j and 193 is number sign a–i–c: [1].

Named after its creator, Louis Braille, it is a system of making raised dots on paper to form letters and words that are read by the blind with their fingertips. The basic Braille 'cell' consists of two columns of three dots. The dots are numbered 1-2-3 from top to bottom on the left side of the cell and 4-5-6 from top to bottom on the right side of the cell. Each Braille letter, word, punctuation mark, number, or musical note can be made using different combinations of these dots. Braille can be written with a Braillewriter (similar to a typewriter) or by using a pointed stylus to punch dots down through paper using a Braille slate with rows of small "cells" in it as a guide. This

method of writing Braille compares to writing print with a pen or pencil [3; 6].

Braille was originally based on a system devised by the French army to send secret messages at night. The night writing was later perfected by Louis Braille for use by the blind. The blind child can read in many places where his or her sighted friends can't: under the covers without the use of a flashlight, in the car traveling at night [2].

When every letter of every word is expressed in Braille, it is referred to as Grade 1 Braille. Many newly blinded adults find Grade 1 Braille useful for labeling personal or kitchen items. Books or other reading materials can also be transcribed in Grade 1 Braille. The system often used for reproducing textbooks and publications in English is known as Grade 2 Braille. In this system, cells are used individually or in combination with others to form a variety of contractions or whole words. For example, in Grade 1 Braille the phrase "you like him" requires twelve cell spaces. If it were written in Grade 2 Braille, this same phrase would use only six cell spaces. The letters Y and L are also used for the whole words "you" and "like" respectively. Similarly, the word "him" is formed by combining the letters H and M. There are 189 different letter contractions and 76 short form words used in English Grade 2 Braille. These short cuts reduce the volume of paper needed for reproducing books in Braille and make reading faster [9; 7].

Braille revolutionized life for the vision impaired. Discover how this remarkable system works. This video will teach you the Braille alphabet, numbers and punctuation marks which are found in Grade 1 Braille [11].

Today there are three methods of writing Braille, just as there are two methods of writing print. A Braille writing machine (comparable to a typewriter) has a keyboard of only six keys and a space bar, instead of one key for each letter of the alphabet. These keys can be pushed separately or altogether. If they are all pushed at the same time, they will cause six dots to be raised on the paper in the formation of a Braille cell. Pushing various combinations of the keys on the Braille writer produces different letters of the alphabet and other Braille symbols.

In Braille, a cell dot pattern gives you the letter to read. The dot height is about 0.5 mm; the space between dots is about 2.5 mm. A standard page in Braille has about 40 – 43 cells per line and about 25 lines. Larger cells are often used by those who have problems feeling the normal Braille cells. Most languages have two grades

of Braille. Grade one is used by beginners. Each letter of the word is spelled out. Grade two Braille is an advanced form. It makes reading and writing quicker because it has special codes for words or groups of letters that are often used in that language. Almost all books use this grade because it saves space and makes reading quicker.

When writing in Braille a person need a slate and a stylus in which each dot is created writing from right to left at the back of the page. There are also special Braille keyboards that you can attach to a computer. Braille is thought to be the main way that blind people can read and write, only few people really use it. Although, in Great Britain, for example only about 20,000 out of 2 million visually impaired actually use Braille. Younger people tend to use electronic text on computers instead. A debate has started on how to make Braille more attractive to users [13].

The Braille reader reads from left to right, for the dots are then on the top side of the paper. Although this may seem a bit confusing, it need not be at all troublesome, since both reading and writing progress through words and sentences from beginning to end in the same manner. The speed of writing Braille with the slate and stylus is about the same as the speed of writing print with pen or pencil.

Braille is also produced by a machine known as a braillewriter. Unlike a typewriter which has more than fifty keys, the braillewriter has only six keys and a space bar. These keys are numbered to correspond with the six dots of a braille cell. In that most braille symbols contain more than a single dot, all or any of the braillewriter keys can be pushed at the same time [8].

Technological developments in the computer industry have provided and continue to expand additional avenues of literacy for braille users. Software programs and portable electronic braille notetakers allow users to save and edit their writing, have it displayed back to them either verbally or tactually, and produce a hard copy via a desktop computer-driven braille embosser. Just as the personal computer has revolutionized writing in print today, it is also possible to produce Braille more easily and quickly than ever before. Assuming that the proper equipment is available, a computer user can now send a document to a standard printer to produce a paper copy in print or to a Braille embosser to produce the document in Braille. And one need not even know Braille to create this miracle [1; 9].

Good Braille readers'like good print readers'can read much faster than they can talk. Today blind people use Braille to take notes in high school and college, to write letters, to read books and magazines, to keep addresses and phone numbers, to keep recipe files, to write books and other materials, and to do the other things you might do using print. There are special libraries that provide Braille and recorded books and magazines for the blind free of charge. Most states have one or more of these libraries where blind people can borrow these materials [3; 4; 5].

It is important to note, that Braille standards for Canada, New Zealand and the United States of America are set by the Braille Authority of North America (BANA). In the United States, the National Library Service for the Blind and Physically Handicapped of the Library of Congress sets standards, based upon BANA's, for its producers. In the United Kingdom, the Braille Authority of the United Kingdom (BAUK) sets the braille standards. In other countries and locations, standards may be set by a similar national or international authority, or by schools or agencies for the blind or other established producers [14].

To sum up, Braille is not a "Universal Language" as some people assume, although many languages do use the same alphabet and today, thanks to Louis Braille, blind people are able to read many books that published in braille.

Though his image is that of a saintly teacher leading the blind out of the darkness, Braille's accomplishments place him alongside Samuel F.B. Morse, Alexander Graham Bell, and Steve Jobs as one of history's great communications technology innovators.

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