Digital Upskilling of Trainers and Rehabilitation of Blind Persons for Work with Refreshable Braille Displays. O. Tomarevska, O. Poliakov, N. Ellanska. *Gerontechnology* 25(s)

Purpose. In 2025, the introduction of refreshable Braille displays was framed within gerontechnology to combine necessity and accessibility with innovation and social inclusion [1]. Ensuring is important, friendly, and happy learning equal digital access for blind users of all ages, including those who acquire vision impairment in adulthood, older workers, and consequently, older adults who have a risk of becoming blind in the future. The purpose of this study is to expand opportunities for training and rehabilitation of people with visual impairments acquired later life in current stage Ukraine. It focuses on corrective education to support tactile recognition of Braille in adulthood, addressing significant technical and physiological barriers. **Method.** After job analysis of Braille teachers, we developed a method for memorizing the coordination of motor movements required to operate Braille displays. This method considers age-related decline in sensorimotor reactions and asynchronous tapping abilities among older workers. Effectiveness and confidence were evaluated using both quantitative and qualitative indicators provided by Braille literacy specialists. **Results and Discussion.** The use of updated Braille displays improves recognition accuracy in both Ukrainian and English Braille. This supports the capability to implement the cognitive method finger warm up for consistency and repeatability in mastering tactile-motor skills and dual-language education for adults. However, the formation of procedural and spatial memory in adulthood presents challenges, requiring vocational rehabilitation or advanced training for older workers (Fig. 1). Updating knowledge in line with international standards enhances language skills, technical competence, Braille literacy, and professional development, thereby supporting continued economic activity. The rhythmic tapping method proved effective across all age groups, with an 87.6% success rate (Tabl. 1). It gradually develops fine motor skills in both hands for controlling the display, entering, and editing information. At the same time, it increased teacher confidence by 81.5% when working with adult learners. Overall, this approach improves access to Online services for blind individuals, supporting health monitoring, primary care, and the continuation of labor, economic, and social activities among older blind workers.

References

1. European Commission. The EAA comes into effect in June 2025: are you ready? AccessibleEU, 2025.

Keywords: Upskilling, vocational rehabilitation, Braille displays, procedural memory, tactile-motor skills
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Table 1. Expert evaluation the effectiveness of dual pathways for vocational training and rehabilitation: supporting tactile-motor and procedural memory in Braille display use

Category	Key Findings
Volume of procedural memory for mastering the sequence of finger movements from Braille typing *(numbers = 12)*	• For a clearly remembered number of numbers after one viewing of an audiovisual work for two weeks 1-2 numbers: 12.5% • 3-4 numbers: 18.75% • 5-6 numbers: 12.5% • 7-8 numbers: 37.5% • 9-10 numbers: 18.75% • 11-12 numbers: 0%.
Average effectiveness of the method according to expert assessment where the scale is from 10% ineffective to 100% most effective number of respondents 16	• In the group 20-39 years old: 96.66% • 40-49 years old: 85% • 50 - 59 years old: 72.86%• 60-69 years old: 95% • Total cohort mean performance score 87.6% according to expert evaluation of the method after single listening and viewing of the audiovisual work.

Figure 1. Dual pathways for vocational training and rehabilitation: supporting tactile-motor and procedural memory in Braille display use