Co-funded by the Erasmus+ Programme of the European Union

Erasmus+ project "Designing Educational Materials and Teaching Digital Literacy to Individuals with Autism" - DEMTeDLIA

Key findings and recommendations on stakeholders' survey in teaching/using digital tools

Introduction:

All DEMTeDLIA partners performed a thorough examination of academic journals, reports and scholarly sources to gather insights into following research questions:
- effective strategies for teaching digital literacy and coding to individuals with autism
- autistic behaviors and learning barriers
- teaching methods and effective pedagogical approaches for individuals with autism
- inclusive learning environments
- educational resources for individuals with autism
- development of education and training materials for digital literacy and coding
- employability skills for individuals with autism in the digital era
- curriculum development for educators and
- existing frameworks for micro-credentials and open badges.

Through this comprehensive literature review, we gathered over 500 scientifically validated questions on those topics. The survey questions were carefully chosen from the main findings in the literature. This was done to ensure the questions are effectively capturing relevant findings. Literature review provided for us a broad understanding of the existing research, theoretical frameworks and research studies related to our subjects of interest. The questions were designed in correlation to recognized academic perspectives and by analyzing established methodologies. As a result, the collected data reinforces existing academic understandings and contributes to new insights in this field. These questions were then utilized in the development of five questionnaires to ensure a structured and well-founded approach to data collection.

Five questionnaires were developed, each tailored to a specific target group - educators, parents, professionals working with individuals with autism, IT professionals and students. The aim was to design surveys that would collect quantitative data on each group's perceptions, experience and needs regarding teaching digital literacy and coding skills to individuals with autism. Each survey was uniquely tailored for the respondent group's particular role and activity. Data collection consisted of reviewing current practices, identifying the challenges faced and understanding the types of support and resources they require. In addition, the surveys captured their perceptions regarding the benefits and potential of offering digital literacy and coding skills to individuals with autism.

Ethical approval for conducting the survey was obtained from the Ethics Committee of Life Activities Advancement Institute (LAAI) from Belgrade, Serbia, one of the partner organizations involved in the project.

1. Autism professionals

Findings:

- Strong preference for structured, individualized, visually supported pedagogies. Universal Design for Learning (UDL), scaffolding and visual supports are critical.
- Hands-on, kinesthetic methods (e.g., robotics) work well, especially for younger children or those with sensory needs.
- Block-based coding (Scratch, Blockly) is preferred for ages 3-12; text-based languages (Python, JavaScript) only suitable for older learners with support.
- Materials must be adaptable, sensory-friendly and minimize cognitive load.
- Significant lack of autism-specific learning materials and training on digital literacy and coding.

Recommendations:

- Apply UDL and scaffolding in all digital literacy instruction.
- Provide a range of coding tools (block-based for younger learners; text-based for older) with proper supports.
- Ensure materials are customizable, multimodal (visual, tactile, auditory) and available offline.
- Create formal channels for autism professionals to co-design materials and establish repositories of autism-friendly resources.

- Deliver hands-on, practice-oriented professional training and mentoring programs.

2. Educators

Findings:

- Most educators use printed and step-by-step materials; gamified and interactive tools are underutilized.
- Individualized instruction and highly structured environments are seen as most effective. Visual supports and ILPs (Individual Learning Plans) rank high.
- Limited parent involvement and inconsistent collaboration with specialists reduce impact.
- Significant need for autism-specific resources, assistive technology and training on adapting materials and instruction.

Recommendations:

- Develop modular training in UDL, TEACCH, explicit instruction and scaffolding.
- Build open-access repositories for adaptive, inclusive content (audio, visual, tactile formats).
- Increase parent engagement in small group learning and create collaborative educator forums.
- Promote gamified, project-based learning to increase motivation and engagement.
- Provide pathways for educators to co-create and pilot inclusive coding curricula.

3. Families (parents and caregivers)

Findings:

- Parents are highly motivated to support their children's digital literacy and coding but lack confidence and training.
- Over 70% believe digital skills are important for their children's future employment, but 76% have received no training in digital tools.
- Barriers include lack of autism-adapted tools, insufficient guidance and children's disengagement with poorly designed technology.
- Parents want to co-learn with their children and participate in co-designing educational content.

Recommendations:

- Develop modular, personalized digital programs aligned with children's sensory and cognitive needs.
- Offer parent workshops (in-person, online, hybrid) and coaching by inclusion specialists.
- Create peer support networks and family-oriented coding projects to reduce pressure and promote co-learning.
- Provide free, intuitive autism-friendly platforms and resources with clear visual guides.
- Move focus from screen time limits to screen purpose and content quality.

4. IT professionals

Findings:

- Broad consensus that curricula must offer personalized paths, adaptive tools, real-world applications and sensory-sensitive design.
- Very few professionals have developed autism-friendly curricula, but there is high willingness to contribute if supported.
- Major barriers to inclusion include lack of resources, structured training, mentorship and accessible workplaces.

Recommendations:

- Deliver structured workshops on autism-inclusive teaching and material adaptation.
- Co-develop modular curricula that integrate real-world coding applications and adaptive technologies.
- Establish mentorship networks connecting education and industry.
- Redesign hiring and workplace environments to reduce bias and increase accessibility for neurodivergent talent.

5. Students (future professionals)

Findings:

- Over 80% were bachelor's-level students, with strong interest in learning about autism and inclusive technologies.
- Autism awareness is high, but misconceptions remain (e.g., equating autism with intellectual disability).
- 72% have never received instruction on using technology to support individuals with autism; only 4% have had coursework on autism and digital technology.

- Students intuitively recognize that coding and digital tools can benefit autistic learners but lack exposure to practical applications.

Recommendations:

- Integrate autism and digital inclusion topics into undergraduate and graduate curricula.
- Develop cross-disciplinary courses that teach assistive technologies, coding and inclusive design.
- Provide opportunities for students to engage in real-world co-design projects with autistic individuals, families and educators.

Cross-cutting recommendations

1. **Create national and regional repositories** of autism-adapted educational resources (templates, lesson plans, assistive technologies).
2. **Strengthen interdisciplinary collaboration** between autism professionals, educators, families, IT experts and future professionals.
3. **Invest in inclusive platform design**, ensuring sensory accessibility, personalization and offline access.
4. **Develop mentorship and peer-learning networks** to share best practices and build community across stakeholder groups.
5. **Embed inclusive digital literacy and coding education** in all stages of the learning continuum-from preschool through professional training.