Digital Competences in Learners with Disabilities*

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Spremenjene kode polj

Abstract

The study explores the early development of digital competences in adapted educational programs with lower educational standards (NIS) and special education programs (PPVI) in Slovenia. The study focuses on which areas of digital competence institutions prioritize, how these choices are explained, and what training needs teachers identify at the beginning of the process. Data were collected through a questionnaire administered in seven institutions participating in the DigComp PP project. Findings indicate a predominant emphasis on basic digital skills and online safety, while more advanced competencies and specialized assistive tools remain largely absent. Teachers expressed a strong demand for practical training and accessible resources tailored to diverse learning profiles. The study highlights systemic barriers to digital inclusion and underscores the need for targeted, sustainable support to strengthen inclusive and technology-enhanced learning environments.

Keywords

Adapted educational programs (NIS), digital competences, digital inclusion, learners with disabilities, special education programs (PPVI), teacher training.

1 Introduction

Contemporary digital society is built on the principles of accessibility, inclusion, and fairness. Yet the needs of individuals requiring adapted learning approaches—due to developmental, emotional, or physical challenges—are often overlooked. Among them are children and adolescents enrolled in adapted educational programs with lower educational standards (NIS) and in special education programs (PPVI). In line with the United Nations (2006) *Convention on the Rights of Persons with Disabilities*, the term *learners with disabilities* is used to refer to this population. In international literature, these groups are often described within the broader concept of special educational needs (SEN). In the Slovenian context, however, they represent the subgroup of learners whose disabilities require the most extensive curricular and organizational adaptations.

While various adapted programs and support measures, regulated by national legislation and professional guidelines, provide a framework for equitable education, implementation often neglects one key area: the systematic development of digital competences—essential for independent engagement in the digital world. The legislative framework—including the *Placement of Children with Special Needs Act* [1], *Elementary School Act* [2], and relevant national guidelines [3–6]—defines target groups and support measures. However, emphasis remains on basic knowledge and social integration, with digital literacy largely underrepresented.

In analyzing adapted provision, it is important to distinguish between methodological adjustments within the existing curriculum and fully adapted educational programs which involve curricular and goal-related modifications [1]. This distinction shapes the ways in which learners engage with technology in everyday instruction.

In recent years, digital competences have become central to educational strategies both at the EU and national levels. Key documents—such as the *Digital Education Action Plan (2021–2027)* [7], the *Digital Skills and Education Package* [8], and the national strategy *Digital Slovenia 2030* [9]—stress the importance of inclusive digital education and reducing the digital divide. Yet learners with disabilities in NIS and PPVI programs remain persistently underrepresented in these frameworks.

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Despite ambitious strategies, the lack of targeted studies and feedback from practice indicates that these learners are often systemically disadvantaged in developing digital competences. Challenges include a lack of suitable materials, limited teacher training, and poorly adapted tools.

Against this background, the present study explores how digital competences can be developed systematically and sustainably among learners with disabilities in NIS and PPVI programs. The analysis focuses on the competence areas prioritized by institutions, the rationales behind these priorities, and the professional development needs reported by teachers. Data were collected in several institutions participating in the DigComp PP project. The following sections present the study design, describe the needs assessment, and analyze findings on priorities, practices, and challenges identified by participating institutions.

Accordingly, this study addresses the following research questions:

1. Which areas of digital competence are prioritized in institutions implementing adapted educational programs with lower standards (NIS) and special educational programs (PPVI)?
2. What practices and rationales guide the selection of these competences?
3. What professional training needs are identified by teachers working with learners with disabilities?

2 Methodology

The present study draws on data collected during the initial phase of the *DigComp PP – Digital Competences for the Field of Special Needs Education*. The questionnaire used as the basis for the analysis was not part of the project's formal evaluation process but was instead developed as a complementary tool for research and development purposes. The purpose of the questionnaire was to capture initial orientations, exploratory initiatives, and institutional approaches to the integration of digital competences in the education of learners with disabilities.

Data collection took place in January 2025, at a time when the institutions had already joined the project, but core activities had not yet been fully implemented. The questionnaire was intended as a tool to capture early developments and practical challenges, with the purpose of informing the design of targeted support measures in the subsequent phases of the project.

2.1 Sampling and Participants

The study involved seven educational institutions from different regions of Slovenia. All participating institutions, engaged in the DigComp PP project, implement adapted education programs (NIS) or special education programs (PPVI) for learners with disabilities. In each institution, the project coordinator completed the questionnaire after consulting with teaching and professional staff.

2.2 Instrument and Content

The questionnaire was designed using the 1KA online survey tool (Arnes) and included a combination of closed- and open-ended questions. It focused on the following key areas:

- digital tools most frequently used by teachers in working with learners with disabilities,
- areas of digital competence that institutions are currently developing or intend to develop,
- reasons for selecting these areas,
- needs for further professional development among educational staff.

2.3 Data Analysis

The collected data were analyzed using basic descriptive statistical methods (frequencies, percentages). Open-ended responses were examined through qualitative content analysis to identify key themes and patterns in the participants' answers. The aim of the analysis was not to test hypotheses, but rather to gain an understanding of early directions and perceived needs, which would serve as a foundation for guiding the subsequent stages of the project.

2.4 Limitations

The study was conducted on a small, purposively selected sample and at a specific point in time, when the project's activities had not yet been fully operationalized. Nevertheless, the data provides valuable insights into early developmental directions and approaches and can inform practical recommendations within the broader context of developing digital competences among learners with disabilities

3 Results

The collected data reveal a heterogeneous but recognizable pattern of early initiatives and emerging priorities concerning the integration of digital technologies in the education of learners with disabilities.

3.1 Use of Digital Tools

The following figure illustrates the digital tools most frequently used by participating institutions in their work with learners with disabilities.

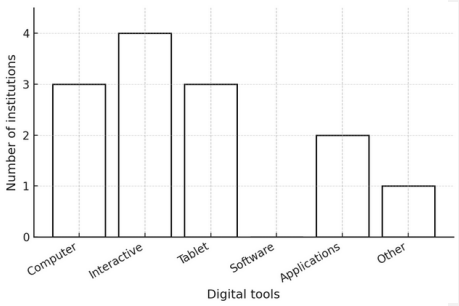

Figure 1: Most Used Digital Tools in Participating Institutions

Note. Interactive – Interactive whiteboard, Software – Software for adapted learning, Applications – Communication and collaboration applications.

Figure 1 presents an overview of the digital tools most used in participating institutions at the time of the survey. The responses indicate a diverse but still relatively conventional digital infrastructure, with interactive whiteboards and tablets being the most frequently mentioned. Tools for communication and collaboration, such as Microsoft Teams, were also in use, albeit to a lesser extent. In several cases, respondents referred more broadly to devices like desktop computers and projectors, as well as general-purpose software including Microsoft Office and Canva.

Notably, none of the institutions reported the use of specialized educational software designed specifically for adapted learning. This absence may suggest limited availability, accessibility, or integration of such tools into daily pedagogical practice, and points to a potential area for further development.

3.2 Selected Areas of Digital Competence

The figure below provides an overview of the digital competence areas that participating institutions identified as priorities for development in their work with learners with disabilities.

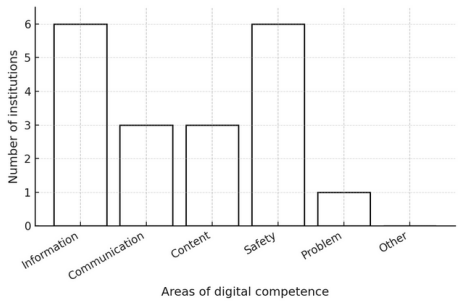

Figure 2: Priority Areas of Digital Competence Development in Participating Institutions

Note. Information – Information and data literacy, Communication – Communication and collaboration; Content – Digital content creation, Safety – Safety and well-being in the digital environment, Problem – Problem solving using digital technologies.

The participating institutions were asked to identify the areas of digital competence they are currently developing or planning to introduce in their work with learners. As shown in Figure 2, the two most frequently prioritized areas were information and data literacy and safety and well-being in the digital environment, each selected by six out of seven institutions. Communication and collaboration and digital content creation were moderately represented, each mentioned by three institutions. Only one institution reported focusing on problem solving using digital technologies.

The results suggest that, at this early stage of implementing digital competence development, institutions are primarily focusing on foundational competencies—navigating digital environments, managing information, and ensuring safe use of technology. These serve as a crucial baseline for the future development of more advanced and autonomous uses of digital tools in both educational and everyday life.

3.3 Reasons for Selecting Digital Competence Areas

The analysis of responses reveals several key motivations behind participating institutions' selection of specific digital competence areas for development among learners with disabilities. While the responses were diverse, four dominant themes emerged.

3.3.1 Developing Basic Digital Skills for Everyday Life. The most frequently cited reason was the importance of equipping learners with essential digital skills to support their autonomy in daily life. Respondents emphasized the need to begin with foundational knowledge—understanding device functions, searching and evaluating information, and using the internet safely:

"We believe that learners need the most support in these areas."
"They need to learn the basics so that we can gradually build their knowledge and skills over the coming years."

3.3.2 Digital Safety as a Prerequisite for Inclusion. A strong emphasis was placed on digital safety, including the protection of personal data, critical evaluation of online content, and awareness of risks. Institutions identified this area as particularly important, given learners' difficulties in judging the appropriateness of digital content:

"Safety and well-being in the digital environment is one of the most important areas."
"A session for learners on online safety—such as truthfulness of information and sharing personal data—would be very welcome."

3.3.3 Alignment with Curriculum and Building on Existing Knowledge. Several institutions justified their choices by referencing curriculum goals and the need to build digital competence progressively:

"Because it aligns with curriculum guidelines, our own interest, and above all, enriches the learning process."
"Learners in adapted educational programs first need to understand the basic functions of digital devices and become familiar with the fundamentals of engaging in a digital environment."

3.3.4 Adapting to Individual Abilities and Needs. A number of responses reflected the necessity of tailoring digital education to the cognitive and developmental capacities of learners in special programs:

"Taking into account the intellectual abilities of our learners and their needs during instruction..."
"Because these areas are the most suitable and necessary for our specific learner population."

These responses indicate that, in the early stages of the project, institutions focused primarily on foundational and safety-related aspects of digital competence. The reasons for this prioritization stem from learners' everyday needs, their developmental characteristics, and the generally low baseline level of digital literacy in these educational programs. Emphasis is thus placed on establishing a solid foundation from which learners can

gradually develop more advanced skills and greater independence in navigating the digital world.

3.4 Learner-Centered Teaching

The analysis of responses provided by institutional coordinators indicates a wide range of training needs, reflecting the diverse starting points of participating institutions and the varying levels of digital maturity among teaching staff. The findings highlight a demand for both general and specialized forms of professional development.

3.4.1 Introductory Training in Digital Competence. Several institutions stressed the importance of basic training that would provide teachers with a shared foundation for further work. This suggests significant variability in existing digital skills within teaching teams and the need for a coordinated starting point.

3.4.2 Digital Safety. Respondents proposed expert-led lectures and hands-on workshops aimed at empowering both teachers and learners to navigate digital environments safely and responsibly.

3.4.3 Augmentative and Alternative Communication. Some institutions highlighted the need for specialized training to support learners with significant communication barriers. In such programs, digital tools are seen as essential for enabling participation and expression, requiring targeted knowledge and adaptations.

3.4.4 Practical Tools for Creating Digital Content. Teachers expressed a need for concrete skills in preparing educational materials and digital content tailored to learners with special needs. Examples include video production, animation, content editing, and the use of platforms such as Scratch, Lego robotics, and Minecraft within curricular contexts. These tools present opportunities for engaging learner-centered teaching.

3.4.5 Utilizing Existing Digital Equipment. Several institutions reported having access to digital devices (e.g., interactive whiteboards and tables) but lacking the knowledge to use them effectively. For instance, one institution noted the need for training in interactive whiteboard use, while another mentioned having an interactive table with outdated software and a lack of support for upgrading and training.

The expressed training needs are highly pragmatic and directly linked to everyday pedagogical practice. While some institutions require general introductory support, others have specific demands related to particular tools, communication systems, or the creation of inclusive digital content. These findings underscore the necessity of an individualized, modular approach to professional development, confirming that one-size-fits-all training formats are insufficient. Instead, targeted, needs-based training models are essential to effectively support teaching staff in this context.

4 Discussion

The findings offer important insights into the initial conditions and early institutional approaches to fostering digital competences among learners with disabilities enrolled in NIS and PPVI programs. Most institutions focus on basic digital literacy and safe technology use, which is consistent with the initial goals of the DigComp PP project and reflects the relatively low baseline of digital readiness in these programs.

A notable caution is observed in the introduction of more advanced competencies, such as problem solving with digital technologies. Institutions tend to prioritize foundational skills—functional literacy, information navigation, and digital safety awareness. This is understandable, given that many learners in these programs require gradual progression, concrete examples, and visual support, while existing digital tools are often not tailored to their cognitive or sensory needs.

The absence of specialized tools for adapted learning is a critical issue. The gap is likely attributable to limited access to high-quality content, lack of localization in the Slovenian context, and insufficient resources suitable for lower cognitive levels, rather than resistance to technology itself. Consequently, teachers frequently resort to improvisation with basic tools (e.g., PowerPoint, Canva, interactive whiteboards) or develop content independently. This highlights the necessity of systemic measures to provide accessible, evidence-based tools designed specifically for learners with disabilities.

Differences in digital competence among teaching staff also play a crucial role in determining the extent to which institutions can introduce digital strategies. Teachers consistently highlighted the necessity of professional development that is practice-focused, modular in structure, and responsive to specific learner profiles. Generic training formats appear insufficient; instead, professional development must address specific needs, such as augmentative and alternative communication, digital safety, and the creation of inclusive education.

These findings align with recent international research, which similarly reports limited digital competences among special education teachers and the urgent priority for structured, targeted training [10, 11, 12]. Importantly, digital competence in this context cannot be reduced to technical proficiency alone. It requires pedagogical adaptation and the capacity to use technology in ways that enhance learning and participation for diverse groups of learners. Validated instruments for assessing digital competence in special education provide a solid foundation for targeted training design and help identify areas needing further support [11].

The results highlight important implications for sustainability. Developing digital competences among learners with disabilities supports long-term social inclusion and employability while reducing systemic inequalities. Targeted teacher training strengthens institutional capacity and fosters professional communities of practice.

Although rooted in the Slovenian context, the findings are transferable to other systems facing similar challenges. The prioritization of basic competences, limited availability of specialized tools, and demand for targeted training are internationally recognized issues. The DigComp PP project therefore offers a potential model of good practice, particularly when aligned with established frameworks such as DigCompEdu, UDL, and TPACK.

Achieving digital inclusion for learners with disabilities in NIS and PPVI programs necessitates systematic planning, sustainable institutional support, and structured professional development for teachers. While the early emphasis on basic competences and safety is appropriate, long-term strategies must encompass advanced competences and systematic use of

specialized tools. The findings underscore the relevance of the DigComp PP project as a driver of sustainable change and as an example of transferable practice in inclusive, technology-enhanced education.

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