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THE LEVEL OF DIGITAL SKILLS AND DIGITAL AWARENESS AMONG WOMEN AND MEN OF GENERATION Z – RESEARCH RESULTS

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Purpose: The aim of this paper is to assess the level of digital awareness and digital skills among Generation Z women and men.
Design/methodology/approach: The analysis focuses on the results of a 2024 study conducted on 361 randomly selected Generation Z representatives. A proprietary survey questionnaire was used. Responses were answered on a 5-point Likert scale. Cronbach's alpha was used to test the reliability of the research tool. The data were then subjected to appropriate statistical analysis.
Findings: Data analysis showed that the average level of digital skills and digital awareness among Generation Z representatives in Poland is 3.74 on a 5-point scale. All areas of digital skills and awareness scored above 3.00, indicating a relatively high rating from respondents. It turned out that the variable values for women and men are very similar, suggesting a similar perception or assessment of the aspects studied by women and men. Analysis of gender differences in digital competences revealed statistically significant differences in the areas of Hardware, Network, AI, and Interest-Knowledge. The results confirm trends in the European Union, where there is no significant difference in the level of digital skills between the genders in the Generation Z group. Moreover, the level of digital awareness is high, and digital skills are well-developed.
Research limitations: Quantitative research has limitations, including the regional nature of the research group. At the same time, qualitative research could complement and expand the conclusions.
Practical implications: The findings from the analysis help us understand how media practices shape skill development, offering practical advice for policymakers who want to equip the younger generation with the skills they need to succeed. Educational programs should focus on fostering key information literacy and safety skills among generations raised in the digital age. Generation Z should embrace interactive tools, and advanced competencies should enable data management and ethical internet use.
Originality/value: This paper contributes to scholarship by identifying the levels of digital awareness and skills among Generation Z individuals and comparing these levels by gender.
Keywords: digital awareness, digital skills, digital competences, Generation Z, women, men.
Category of the paper: Research paper.

1. Introduction

Nowadays, digital skills and competencies are no longer an asset but are necessary for effective functioning in an increasingly digitalized society and economy. They are important not only in the professional sphere but in virtually every aspect of life. Implementing and using digital technologies determines organizational aspects, learning, environments, and everyday life (Van Laar et al., 2017). As the literature on the subject indicates, the concept of digital literacy is extremely broad. It encompasses a rich set of skills and abilities necessary for continuous learning and functioning in digital environments in a critical, creative, and responsible manner (Vishnu et al., 2022). Digital literacy is a key skill that allows for leveraging the benefits of technological progress and a communication tool that enables access, organization, evaluation, and sharing of information across various social groups (Purnama et al. 2021). This is becoming particularly important and compelling in the digital economy, where generations born in the digital age, including Generation Z, play an increasingly important role in the labor market and in building organizational entrepreneurship.

The aim of this paper is to assess the level of digital awareness and digital skills among Generation Z women and men. The article is based on a 2024 survey of 361 respondents. It contributes to science by identifying the level of digital skills and digital awareness among Generation Z individuals and comparing these levels by gender.

2. Literature review

In the digital economy and society, individuals' ability to adapt to new trends and requirements largely depends on attitudes, habits, and knowledge related to digital skills. The process of acquiring such skills and their outcomes is called digital competences (Pongrac, Alić, Cafuta, 2025). According to Rubach and Lazarides (2021), digital competences can be defined as a set of knowledge, skills, abilities, and other characteristics that enable individuals to perform their jobs effectively. These tasks are securing digital resources for information and data processing, communication and collaboration, and problem-solving. This definition can be expanded to state that digital skills are the foundation of success in today's digital society. They are one of the three key competences for lifelong learning, alongside civic and social competences, cultural awareness, and creative competences, defined by the outcomes of safe and critical use of technology (Giurgiu et al., 2008; Haddon et al., 2020). Digital awareness, competence, and digital skills are multifaceted, multithreaded, and linked to the sociocultural context (Olofsson, Fransson, Lindberg, 2019; Caputa et al., 2023). The role and importance

of skills related to digital technologies are frequently discussed in the literature, as they currently affect almost every aspect of life (Falloon, 2020; Haleem et al., 2022).

As indicated by the PARP Report (2023), the youngest generation in the labor market is Generation Z, born after 1990. This group has initial professional experience but is familiar with digital technologies. They are characterized by volatility and a demanding nature (Cho, Lee, 2018). However, their digital skills are high due to their education in the digital era and the constant use of digital technologies and social networks for social interactions (Persada et al., 2019; Gui, Argentin, 2011). Being born and living in an environment heavily dependent on technology shapes Generation Z representatives in a completely different way and influences their behavior in social interactions and acquiring new knowledge (Bullen et al., 2011). There is research available that indicates that factors such as gender, level of education, and geographical location have a decisive impact on digital skills (Hadziristic, 2017; Litt, 2013), and what is more, the level of these skills and awareness in the generation Z group is constantly increasing (Haddock et al., 2022; Surian, Andrea, 2019).

The measurement of digital skills and competences is widely discussed in the literature, partly due to its importance. This concerns implementing digital activities in the contemporary world, including using digital technologies and ICT tools for work, participation in social life, social interactions, leisure, and learning (Vuorikari et al., 2025). In general, digital skills assessment tools have two main characteristics: the measurement of procedural knowledge, i.e., the measurement of operational digital skills, and the measurement of knowledge about digital tools and their use. Recently, however, new elements of measurement tools have been added, offering definitions of digital competence attributes (knowledge, skills, and attitudes), as well as a set of terms that allow for the creation of a common understanding of what digital competences mean (Clifford et al., 2020; Ulfert-Blank, Schmidt, 2022). It can be argued that combining new attributes with measurement tools better accounts for the multi-layered nature of digital competences and their constructs, thus enriching self-assessment tools. Further literature analysis reveals a framework identifying four dimensions that constitute digital skills that can be measured. The areas assessed include:

1. Technical and operational skills.
2. Navigation and information processing skills.
3. Communication and interaction skills.
4. Content creation and production skills.

In this case, a distinction should be made between using the functionality of information and communication technologies (ICTs) and leveraging knowledge to manage interactions in digital spaces (Helsper et al., 2020). The growing importance of digital competences in various aspects of life, from education and work to social interactions and leisure, highlights the need for effective assessment tools. However, existing tools can sometimes be too long or complex (Vuorikari et al., 2025).

To achieve the study's aim, the approach adopted by Aydınlar et al. (2024) was adopted, which identifies a model distinguishing seven domains of digital competences, measuring which a total of 24 competencies and skills were used. Within each of the seven variables, subvariables were identified, defining the scope of skills and competencies in each area:

1) Software and Multimedia, including ease of learning technology, the ability to communicate via simple online platforms, and knowledge of computer languages.
2) Hardware, including the ability to solve technical problems, and technical computer knowledge.
3) Networking, including the ability to communicate online and work via online platforms.
4) Ethics, including knowledge of copyright, licensing, and the provisions of the Personal Data Protection Act.
5) Security, related to cybersecurity and security.
6) AI, related to knowledge of artificial intelligence and its application areas.
7) Interest-Knowledge, related to knowledge of technology, skills, and willingness to learn.

Regardless of the approach to assessing digital awareness and digital skills, they are currently among the most important competencies for every individual, influencing their ability to participate effectively in social and economic life. Therefore, to achieve the study's objective, the following research questions were posed:

1. What is the level of digital awareness among Generation Z?
2. What is the level of digital literacy among Generation Z?
3. In what areas are Generation Z's digital literacy levels higher and lower?
4. Do digital literacy levels differ among Generation Z women and men?

3. Methodology

The paper aims to assess the level of digital awareness and skills among Generation Z women and men. The results presented in this study are part of a larger study. The main study, conducted in 2024, was preceded by a pilot study with 20 respondents. The main study involved 370 randomly selected respondents, including 193 women, 168 men, and nine gender-neutral individuals. Therefore, data for 361 respondents were used for analysis.

The results of the pilot study and a literature review allowed for the development of a research tool: a survey questionnaire. The original questionnaire consisted of a questionnaire and closed-ended questions, including those assessing the level of digital skills and abilities. Respondents' responses were based on a 5-point Likert scale (Sheng, Zhou, Li, 2011).

The identification of digital skills and digital awareness in the study group was based on findings from Aydınlar et al. (2024). Digital awareness and skill levels were divided into seven domains, each of which respondents assess their skills. The following domains of digital literacy were distinguished: Software and Multimedia (DL1), Hardware (DL2), Network (DL3), Ethics (DL4), Security (DL5), AI (DL6), and Interest-Knowledge (DL7).

Table 1.
Reliability and validity (Cronbach's α)

Variables	Cronbach's α
Software and Multimedia (DL1)	0.922
Hardware (DL2)	0.921
Network (DL3)	0.923
Ethics (DL4)	0.919
Security (DL5)	0.919
AI (DL6)	0.923
Interest-Knowledge (DL7)	0.918

Source: own research.

Cronbach's alpha was used to test the reliability of the research tool (Taber, 2018; Christmann, Van Aelst, 2006). The results of the analysis (Table 1) showed that the digital skills and awareness scale has excellent reliability in each of its domains, with Cronbach's alpha ranging from 0.918 to 0.923. The research scales constructed within the tool meet the requirements, and their use in quantitative research is justified based on the classification scheme established by George and Mallery (2016, p. 240).

4. Results

The analysis showed that the average level of digital skills and awareness among Generation Z representatives is 3.74, while the median is slightly higher at 3.92 on a 5-point scale. This difference suggests a slightly left-skewed distribution – meaning that most respondents have scores on the higher side of the rating scale, indicating relatively good digital competencies and skills in the study group. The standard deviation is 0.795, indicating moderate dispersion of results around the mean. Most scores fall within ±1 SD of the mean, ranging from 2.94 (3.74 – 0.80) to 4.54 (3.74 + 0.80). The score range is from 1.33 (min) to 5.00 (max), indicating the full spectrum of ratings on the adopted Likert scale. The lowest value indicates a respondent with very low digital skills, while the maximum value suggests that some respondents rate their digital competencies as the highest possible. Interestingly, the quartile analysis indicates that only 25% of respondents scored below 3.13 (Q1 = 3.13), while 25% of respondents scored above 4.36 (Q3 = 4.36). Half of the sample (50% of the results) fell within the range of 3.13 to 4.36, suggesting moderate variation in scores and a concentration around average and higher values.

The analysis also indicates that all areas of digital skills and awareness (DL1-DL7) achieved scores above 3.00 on a 5-point Likert scale, indicating a relatively high assessment of respondents' digital skills and awareness. The highest mean score was indicated by respondents for DL5, at 4.078, and for DL2, at 3.862, on a 5-point scale. Conversely, the lowest digital skills and awareness were reported for DL1, at 3.419. The standard deviation for the DL1-DL7 areas ranges between 0.89 and 0.98, indicating moderate response variability (Figure 1).

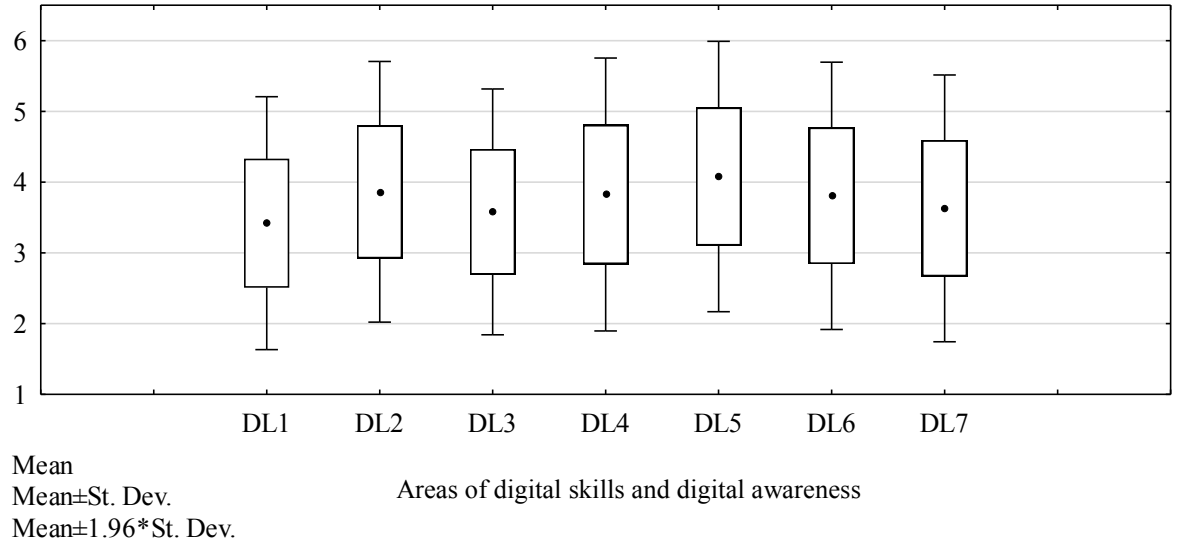

Figure 1. Level of digital awareness and skills of Generation Z (N = 361).

Source: own research.

Further analysis revealed differences between the responses of the surveyed women and men belonging to Generation Z. It turned out that the values for the studied variables (DL1-DL7) for women and men were very similar. The highest ratings (for both genders) occurred in the area of digital skills and awareness DL5, where women declared a level of 4.11, and men a level of 4.05 on a 5-point Likert scale. Women declared the lowest ratings for digital skills and awareness in area DL1, at a level of 3.38, while men declared a level of 3.44 on a 5-point scale in area DL2. In areas DL3, DL5, and DL 6, women have slightly higher ratings of their digital skills and awareness than men. In areas DL1, DL2, and DL7, men have slightly higher ratings of their digital skills and awareness than women. It can be indicated that the differences between genders are minor in each category, DL1-DL7. This indicates that women and men perceive or evaluate the aspects studied very similarly. Figure 2 shows high consistency between the study groups.

Next, the Student's t-test was used to determine whether there were statistically significant differences in the areas of digital skills and digital awareness between women and men. The analysis of gender differences in digital competences revealed statistically significant differences in the areas of DL2 ($t(359) = -3.55$, $p < 0.001$), DL3 ($t(359) = 2.89$, $p = 0.004$), DL6 ($t(359) = 2.53$, $p = 0.012$), and DL7 ($t(359) = -1.98$, $p = 0.048$).

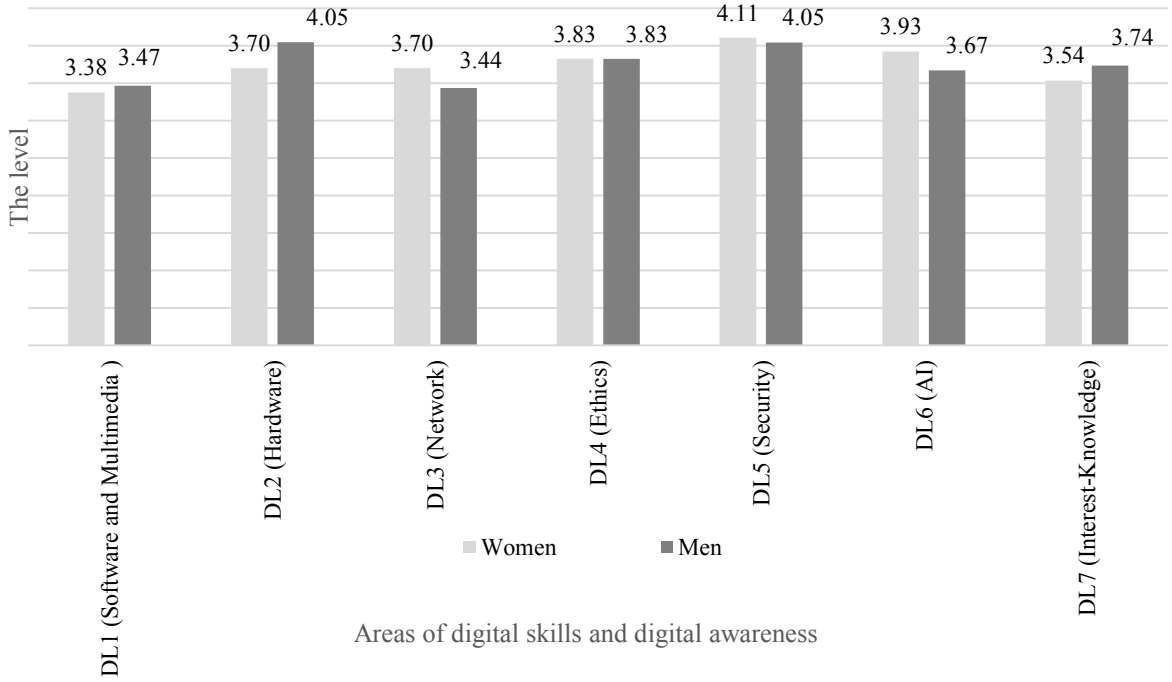

Figure 2. The level of digital literacy and awareness among Generation Z women and men (N = 361). Source: own research.

No significant differences were found for the remaining variables, i.e., DL1, DL4, and DL5. Additionally, Levene's test (F ratio) showed that for most variables (DL1, DL2, DL3, DL4, DL6, DL7), $p > 0.05$, which means that equality of variances is assumed (the t-test result for equal variances is correct). The exception is the value for the DL5 area ($p = 0.047$), but the result is statistically insignificant.

5. Discussions and Conclusion

The results confirm trends in the European Union, where there is no significant gender difference in digital literacy levels within Generation Z. Generation Z is highly technically proficient (using tools, using social media, communicating), meaning their digital awareness is high. Their digital skills are well-developed (Stjepic, Vukšić, Suša Vugec, 2019), a finding confirmed by research. Research shows that the information-searching abilities of people born in the digital age can improve, among other things, their academic performance, and that better technical and operational communication skills are associated with positive behavior, coping with online threats, and overall life satisfaction (Eynon, Malmberg, 2012). As individuals raised in the digital age enter the labor market and become active members of society, they will play a key role in shaping future policy. The importance of developing and improving digital skills is therefore undeniable. Both individual habits and systematic educational processes significantly influence the acquisition and development of these skills. It should be noted that

digital awareness, although high according to our own research and literature review, often does not extend to critical awareness, digital safety, and digital hygiene, which are often at a lower level.

The literature review also indicates that educational programs should focus on fostering key information and safety skills among generations raised in the digital age. These social groups should utilize interactive tools and age-appropriate content, and advanced competencies should enable data management and ethical use of the internet to prepare for the challenges of a digital society (Buchan et al., 2024). As Gołaszewska-Kaczan and Kuzionko-Ochrymiuk (2023) emphasize, the development of the digital economy forces all members of society to improve their digital skills. These skills are essential not only in professional work but also in everyday life. A lack of competencies in this area may soon contribute to digital exclusion, as limited opportunities to participate in modern forms of culture or the inability to access the expanding range of digital public services.

The quantitative research conducted has its limitations, including the regional sample size. Expanding the geographic scope and including participants with diverse socioeconomic statuses and educational backgrounds would enhance the inferences and generalizability of the results. Furthermore, extending the research to include qualitative methods and incorporating objective assessments of digital competences into the self-assessment data would reduce the impact of potential response biases and provide a more comprehensive understanding of digital competence levels.

Despite the limited sample size and scope of the study, as well as the narrow focus on digital competence dimensions, the study provides valuable insights into the differences in digital awareness and skills between two distinct groups of individuals raised in the digital age. The findings from the analysis contribute to our understanding of how media habits influence competence development, offering practical guidance for policymakers who strive to equip individuals raised in the digital age with the skills necessary to succeed in a rapidly changing technological world.

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