The Role of Awareness and Level of Digital Literacy in Creating Entrepreneurial Intentions in Generation Z Women

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Abstract: Currently, modern market conditions for the development of entrepreneurship are extremely uncertain and highly turbulent. The speed and intensity of changes in the business environment make starting your own business a high risk. Entrepreneurial intentions play a particularly interesting role in the decision-making process to start your own business. The literature review indicates that the factors influencing intentions include the abilities and skills of future entrepreneurs, including their level of digital skills and competence. Knowledge of digital technologies enables future entrepreneurs to access reliable and up-to-date information and increases the opportunities for continuous learning. Digital literacy facilitates effective communication and collaboration between businesses. These competencies help to understand the implications of using digital technologies and support the use of digital tools in company management. The aim of the paper is to identify the awareness and digital literacy that influence the entrepreneurial intentions of Generation Z women. The study conducted in 2024 is based on the results of research on a group of 193 Polish women, representatives of Generation Z. An original survey questionnaire was used to collect the data. An original survey questionnaire was used to collect the data. The analysis based on the data showed the level of digital literacy of Polish Generation Z women and which of them influence the level of entrepreneurial intentions. The novelty of the paper is the indication of areas of knowledge regarding digital skills that determine the entrepreneurial intentions of Polish Generation Z women.

Keywords: Digital Literacy, Digital Skills, Digital Competences, Entrepreneurial Intentions, Women's Entrepreneurship, Generation Z, Poland

1. Introduction

Assuming that entrepreneurship is the basic condition for development, innovation, and economic growth, it should be perceived as a process in which external and internal conditions determine its level. Entrepreneurial attitudes, subjective norms, flexibility of action, and acquired experience and knowledge are in constant interaction with each other and determine entrepreneurial intentions, which influence entrepreneurial behavior (Crisp & Turner, 2009; Zbierowski, 2014; Abubakar et al., 2019; Czaplińska, 2020). In the face of rapidly changing environmental conditions and competitive pressure, future entrepreneurs also need to develop the ability to respond and better adapt to the dynamic business environment (Cheng 2007). Awareness and knowledge of digital technologies enable future entrepreneurs to have access to reliable and up-to-date information and increase the opportunities for continuous learning. The ability to use digital technologies facilitates effective communication and cooperation with other enterprises and activities in clusters and associations. It helps to understand the modern implications of using digital technologies and supports the use of digital tools in running and managing a business (Aydınlar et al, 2024). It can therefore be said that it strengthens future entrepreneurs in their decisions regarding starting a business and therefore strengthens their entrepreneurial intentions.

The aim of the paper is to identify the awareness and digital literacy that influence the entrepreneurial intentions of Generation Z women. The conclusions are based on the results of research from 2024 on a group of Polish Generation Z women. The paper contributes to science by combining the identified awareness and level of digital competences with entrepreneurial activity, in particular the entrepreneurial intentions of Generation Z Polish women.

2. Literature Review

2.1 Awareness and Level of Digital Literacy

Digital technologies are playing an increasingly important role in the economy and development of regions. It can be indicated, based on a review of the literature, that they are a determinant enabling the creation of new ventures. Researchers indicate that it is even the greatest force for entrepreneurship and innovation (Nambisan, 2017; Shane & Venkataraman, 2000; Berger et al, 2021; von Briel et al, 2021). Digital technologies allow current and future entrepreneurs to gain valuable and timely market insight, improve their ability to respond to changes in the environment, reduce transaction and communication costs, expand the scope of their market, promote international exchanges, and reduce cultural, organizational, and institutional boundaries (Dabbous, Barakat &

Kraus, 2023). Moreover, technological change driven by the use of artificial intelligence acts as an external factor influencing new entrepreneurial activity (Davidsson, Recker & von Briel, 2020).

Entrepreneurial opportunities preceded by intention, thanks to digital skills, become possible not only for existing enterprises, but also for new business opportunities. They allow you to introduce innovations, assess risks, take advantage of opportunities or flexibly organize business (von Briel et al, 2021). Rapid technological progress forces the building of future-oriented competencies, especially for future entrepreneurs, including employees (Punie, Ferrari & Brečko, 2013; Sergi et al, 2022). Research on entrepreneurship focuses on the factors influencing it, including entrepreneurial competences. Researchers confirm that knowledge of digital skills is positively associated with entrepreneurial intention, which proves to be a reliable predictor of entrepreneurial actions and activities (Fayolle & Gailly, 2015; Reis, Fleury & Carvalho, 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 are tasks related to the use of digital means in a secure way to process information and data, communicate and collaborate, and solve problems (Rubach & Lazarides, 2021).

Following Aydınlar et al. (2024), it can be indicated that digital competences are divided into seven areas, which include:

- Software and multimedia, including, among others: ease of learning technology, ability to communicate through simple Internet platforms, knowledge of computer languages;
- Hardware, including, among others, the ability to solve technical problems, technical knowledge of a computer;
- Network, including the ability to communicate on the Internet, work via Internet platforms;
- Ethics, including knowledge of copyrights, licenses and provisions of the Personal Data Protection Act;
- Security related to cybersecurity and security;
- AI related to the knowledge of artificial intelligence and areas of its use;
- Interest-Knowledge related to knowledge of technology, ability and willingness to learn.

In today's business conditions, running your own business requires very complex skills compared to previous years. In order to effectively run a business, a future entrepreneur must combine, use, and implement new technologies to create innovation. Therefore, awareness of digital technologies and the ability to use them are important. The literature review indicates a paucity of research on individual digital skills that may determine entrepreneurial intention, therefore the following research questions can be constructed: *What level of awareness of digital technologies is needed when creating entrepreneurial intentions? Which competencies related to digital technologies determine the process of starting your own business or influence entrepreneurial intentions?*

2.2 Entrepreneurial Intentions

The literature review does not indicate a clear definition of "entrepreneurial intentions." It can be pointed out, following Kadir, Salim and Kamarudin (2012), that it is the intention to create a new business venture in the form of a new company. Karabulut (2016) believes that entrepreneurial intention initiates future business activities. Therefore, the goal of a future entrepreneur is to plan activities that will produce the expected result. People are ready to raise funds, take risks, and create a venture. The first critical step on the path to an entrepreneurial career is the formation of entrepreneurial intentions, which can be understood as a person's independent belief that he or she intends to start a new business venture and consciously plans to do so at some point in the future, regardless of whether this point in the future is known, unknown, or never achieved (Thompson, 2009). Hmieleski and Corbett (2006) stated that entrepreneurial intentions can be defined as intentions to start a business with high growth potential.

The great and growing interest in research on entrepreneurial intentions results, among other things, from the fact that entrepreneurs and entrepreneurial activities play a significant role in supporting social and economic development (Baubonienė et al, 2018) and in the development process for sustainable development (Bouncken, Lapidus & Qui, 2022). Research shows that a higher level of economic growth and innovation requires a higher level of entrepreneurship in a given region or country. Moreover, as the literature review indicates, entrepreneurial intentions determine competitive advantage, which requires flexible, agile capabilities in the process of entrepreneurial activities (Shuyan & Fabus, 2019). The basic assumption that intentions precede actions has sparked a lively debate and research stream in recent years, with researchers searching for and discovering factors that influence entrepreneurial intentions (López-Núñez et al., 2020).

Nijkamp (2003) emphasizes that the literature does not indicate clear factors determining an individual's entrepreneurial behavior. The most important in the process of becoming entrepreneurs are entrepreneurial intentions and behaviors resulting from external and internal conditions (Piróg 2014). Regarding social aspects, the level of entrepreneurial intentions reflects the economic potential and economic environment of the country (Kordos, Krajnakova & Karbach, 2016). Understanding the level of entrepreneurial intention provides researchers and policymakers with the ability to predict future entrepreneurial potential and entrepreneurial activities that can be used to achieve economic goals (Yıldırım, Çakır & Aşkun, 2016). When it comes to internal conditions, these include: individual characteristics of an individual, education and experience, skills, and opportunities for personal development by expanding knowledge and learning (Czaplińska 2020). Intentions are influenced by situational or "demographic" factors, in particular, but greater knowledge contributes to a more realistic perception of entrepreneurial activity (Ajzen, 2002), thus indirectly influencing intentions. The importance of experience and education has been widely highlighted in international research, particularly in the context of the knowledge it provide. Entrepreneurial knowledge, including digital skills and abilities, can therefore be expected to have a clear and significant impact on the formation of intentions (Liñán & Chen, 2006).

2.3 Women and Generation Z

Entrepreneurial intentions reflect the behavior and motivation of individuals to choose the entrepreneurial path over other career choices (Piperopoulos & Dimov, 2015). Gender, an individual characteristic, explains the differences in behaviors and beliefs between men and women. Gender norms are common throughout society and influence not only how individuals view themselves but also how society views and positions them (Murnieks, Cardon & Haynie, 2020). Women have lower professional expectations regarding promotion and success and are less motivated by high income and independence than men (Orlando et al, 2022). Therefore, it can be indicated that entrepreneurship is gender-specific (Murnieks, Cardon & Haynie, 2020), where women recognize opportunities for creative problem solving, perceiving barriers and challenges in a different way than men (Hamilton, 2014). Unfortunately, there is a general bias in society's support for male entrepreneurship. It allows men to more easily build and maintain external relationships conducive to entrepreneurial activity. Moreover, entrepreneurship is culturally perceived as a masculine activity, less suitable for women (Laouiti et al, 2022). However, a review of research on women's entrepreneurship shows that women are characterized by a higher level of passion for entrepreneurship than men (Kyriakopoulos, Herbert & Piperopoulos, 2024), even though, according to the GEM Report (2022), there are three times as many male entrepreneurs. Entrepreneurial passion is positively and strongly associated with entrepreneurial intentions, especially for women (Biraglia & Kadile, 2017).

As the PARP Report (2023) indicates, the youngest generation on the labor market is Generation Z, born after 1990. This is a group of people with initial professional experience who are familiar with digital technologies. It is characterized by variability and demandingness (Cho & Lee, 2018). It can be indicated that representatives of Generation Z are not attached to the company and that they are ready to sacrifice their private time for their own business. Research on Generation Z confirms the great entrepreneurial potential of this employee group (Dreyer & Stojanová, 2023). The conducted review of the literature on the subject and observation of the business environment allowed us to formulate the following main hypothesis: H: *Awareness and level of digital literacy determine the level of entrepreneurial intentions of generation Z women*.

3. Methodology

The aim of the paper is to identify the awareness and digital literacy that influence the entrepreneurial intentions of Generation Z women. The research results are part of a larger study. The actual study was conducted in 2024 and was preceded by pilot studies. A group of Generation Z women was selected for the study due to their role in creating entrepreneurial potential. The survey had 193 respondents who were chosen at random.

The results of the pilot study and the literature review allowed for the development of a research tool, a survey questionnaire. The questionnaire consisted of a summary and closed questions, including: assessing the level of entrepreneurial intentions and digital skills and abilities. Responses on a 5-point Likert scale (Sheng, Zhou & Li, 2011; Peng & Luo, 2000) allowed the use of the managerial approach, which is most often used in the social sciences.

During the data analysis, the level of entrepreneurial intentions was examined based on the assumptions of the Entrepreneurial Intentions Model (EIQ) used by Liñán and Chen (2006). The EIQ model used assumes that future entrepreneurs make the decision to start their own business based on personal preferences, perceived social

norms related to running a business, and their assessed entrepreneurial effectiveness. The developed questionnaire of entrepreneurial intentions (EI) was found to be generally adequate to analyze the intention to become an entrepreneur in this study. In turn, the identification of digital skills in the study group was based on the conclusions from the research of Aydınlar et al. (2024). The awareness and level of digital skills were divided into seven fields, the skills of which were assessed by the respondent. Fields of digital literacy were distinguished: software and multimedia (DL_1), hardware (DL_2), network (DL_3), ethics (DL_4), security (DL_5), AI (DL_6), interest-knowledge (DL_7).

First, reliability tests were run on the created research instrument as part of the analysis of the research findings (Table 1). The Cronbach's alpha coefficient reliability estimation approach was applied (Taber, 2018; Christmann & Van Aelst, 2006).

Table 1: Reliability and validity

Variables	Cronbach's α
EI	0.913
DL_1	0.924
DL_2	0.923
DL_3	0.922
DL_4	0.920
DL_5	0.920
DL_6	0.930
DL_7	0.919
DL_Total	0.933

The results of the analysis showed that the EI scale has an excellent reliability of 0.913, while the DL scale has excellent reliability in each of its domains, with an overall reliability of 0.933. It turns out that the research scales built within the tool satisfy the requirements, and their application in quantitative research is warranted based on the classification scheme that George and Mallery (2016, p. 240) established.

4. Results

The analysis of the research results was carried out in several stages, and the following research questions helped to implement them:

1. What is the level of EI of Generation Z women?
2. What is the level of awareness of digital technologies necessary for running a business among Generation Z women?
3. What is the level of DL of Generation Z women?
4. Is there a statistically significant relationship between the level of digital awareness and literacy and the level of EI of Generation Z women?
5. Which digital capabilities and skills determine the increase in EI among Generation Z women?

The analysis of research results on a group of Polish women representatives of Generation Z showed that the average level of their EI is 3.56 on a 5-point Likert scale and this level differs by +/-0.849 points from the average value. At least 50% of the respondents ranked level of EI at a level of 3.60 or below on a 5-point scale, according to the median value for the category.

The survey results also confirmed that respondents have a high level of awareness of digital technologies necessary when running a business. This level was set at 4.58 on a 5-point scale and this level differs by +/-0.952 points from the average value.

Further analysis of the data showed that the overall level of DL is 3.73 on a 5-point Likert scale and this level differs by +/-0.831 points from the average value. The median value for the level of DL_Total indicates that at least 50% of the respondents rated DL at the level of 3.881 or less on a 5-point scale. At the same time, it turned out that the highest level of DL occurs in the field of security at the level of 4.14 and in the field of ethics at the level of 3.91 on a 5-point scale. The lowest level of DL was declared by respondents in the field of software and multimedia at the level of 3.38 and interest-knowledge at the level of 3.54 on a 5-point scale (Fig. 1).

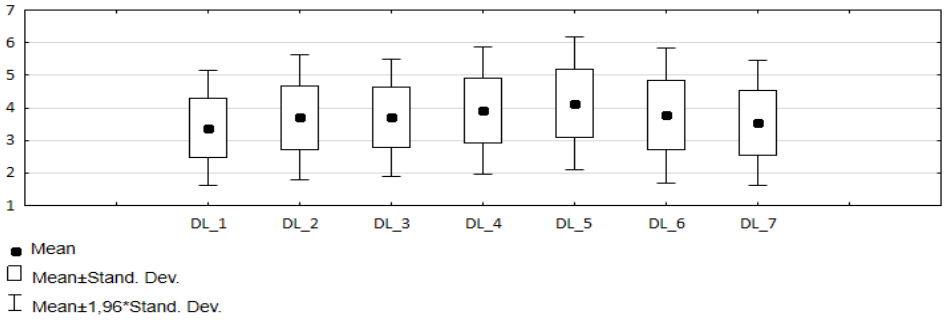

Figure 1: The level of DL among Generation Z women (n=355)

The Kendall's tau correlation coefficient was used to determine whether there was a linear relationship between the variables (Table 2). In the following stage the correlations between the level of EI and fields of DL were identified. The analysis showed that the correlations between the variables are statistically significant for $p<0.05$ and can be described as poor positive, ranging from 0.115 to 0.256.

Table 2: Correlation analysis (n=193)

Fields of Digital Literacy	Entrepreneurial Intentions
DL_1	0.250*
DL_2	0.126*
DL_3	0.115*
DL_4	0.214*
DL_5	0.235*
DL_6	0.256*
DL_7	0.141*

*Kendall's tau correlation (p-value<0.05)

Multivariate linear regression analysis was performed using the stepwise method, which allows for examining the significance of the next introduced variable, as well as examining a different arrangement of variables at each step (Montgomery, Peck & Vining, 2012). The modeling results after introducing all variables are shown in Table 3. Ultimately, there are four variables left in the model that are statistically significant, namely DL_1, DL_6, DL_3, and DL_4. The fit of the model to the data was assessed with the R2 coefficient, which was 0.2274, so it can be indicated that the four variables that entered the model at $p<0.05$ explain it in 22.74%.

Table 3: Modelling result, final model

(N=193)	b*	SD with b*	b	SD with b	T (348)	p
Intercept			2.163	0.285	7.59	0.000
DL_1	0.477	0.115	0.502	0.121	4.14	0.000
DL_6	0.265	0.092	0.238	0.083	2.87	0.005
DL_2	-0.212	0.124	-0.206	0.121	-1.71	0.089
DL_3	0.216	0.104	-0.223	0.107	2.09	0.038
DL_4	0.232	0.100	0.222	0.096	2.31	0.022
DL_7	-0.140	0.120	-0.135	0.116	-1.17	0.245
Multiple R=0.4769; Multiple R2=0.2274; Adjusted R2=0.2025; F (6.186)=9.1244; p=0.00000; Standard error of estimation=0.849						

The results of the analysis showed that awareness and level of digital literacy in the field of software and multimedia have the greatest impact on the increase in the entrepreneurial intentions of Generation Z women.

The next field is artificial intelligence, networks, and ethics. Interestingly, awareness and level of digital literacy in the fields of hardware and interest-knowledge were not included in the built model.

5. Discussion

Entrepreneurial intentions reflect the behavior and motivation of individuals to choose an entrepreneurial path over other career choices (Tantawy et al, 2021). Recent empirical research in the literature on the subject has confirmed that entrepreneurial passion has a significant positive impact on entrepreneurial intentions, which in turn determine the growth of regional entrepreneurship (Kyriakopoulos, Herbert & Piperopoulos, 2024). The study results show that individuals' entrepreneurial intentions are influenced by digital skills (Aydınlar et al, 2024). The positive relationship between women's digital skills and their entrepreneurial intentions shows that knowledge in selected areas determines women's entrepreneurship in regions. This confirms the research of Biraglia and Kadile (2017), which indicated such a relationship. Not all digital skills of future entrepreneurs equally determine their intentions to start their own business. It turns out that knowledge of the simplest digital skills helps in making decisions about the future entrepreneurial path. Moreover, awareness of this knowledge also determines entrepreneurial intentions (Sergi et al, 2022). Therefore, it can be indicated that women with knowledge in the field of digital technologies are more willing to decide to start their own business (Bachmann et al, 2024).

6. Conclusion and Future Research Directions and Limitations

To sum up, the analysis conducted allowed us to answer the research questions. The research results showed that the awareness and level of digital skills positively determine the entrepreneurial intentions of Generation Z women. It can therefore be indicated that the formulated research hypothesis has been confirmed. The model included only four variables determining the level of digital skills in the fields of software and multimedia, AI, networks, and ethics. Therefore, the analysis made it possible to identify areas of knowledge in the field of digital technologies that should be strengthened in the case of activities to increase entrepreneurship in regions or the country.

The research conducted is not free from limitations. Firstly, the study was conducted on a selected group of Generation Z women; the selection of a broader research group (representative) would allow for a more thorough analysis and generalization of the results. Secondly, the study was conducted only in Poland, where the level of entrepreneurship is not high.

In the future, the authors plan to continue research in the area of the analysis of factors influencing the growth of entrepreneurship in general with a representative group of people, also abroad. The researchers plan to expand the analysis to include research on a group of men, which will allow for a comparative analysis and provide recommendations for individual research groups in a turbulent business environment.

7. Theoretical and Practical Implication

Our research makes several important contributions to the literature linking individual-level entrepreneurship, education, and digital technologies. Additionally, the study has several implications for practitioners. Recommendations in the area of activities to strengthen digital awareness and skills, especially for women, are becoming the basis for functioning in an extremely changeable business environment. Focusing on activities that increase the level of knowledge, including the level of knowledge regarding digital skills in areas that determine entrepreneurial intentions, may become the key to the development of entrepreneurship in a region or country. All the more so because women's passion for entrepreneurship is higher in international research compared to men. Therefore, an increasing number of women entrepreneurs will have a positive impact on the development of regions and the country.

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