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The Criterion of Place of Residence in Research on the Knowledge of Industry 4.0 in a Group of IT Students

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Abstract:

Purpose: *The aim of the article was to analyze the knowledge about Industry 4.0 in a group of IT students. It was assumed that the place of residence of the respondents is one of the factors determining the attitudes and opinions about Industry 4.0, preparation for functioning in its conditions and awareness of the importance and potential benefits of such solutions. The influence of this determinant has been investigated.*
Design/Methodology/Approach: *We present the results of research conducted in a group of 236 IT specialization students in 2019 and 2020. A purposive sampling was used. The survey was conducted in a group of students of the Lublin University of Technology in December 2019 and January 2020. The study covered a group of 236 students of Computer Science in full-time studies. The questionnaire was used as a research tool. The survey was conducted in the CAWI (Computer Assisted Web Interview) technique.*
Findings: *The research results show that the place of residence is one of the factors determining the knowledge and perception of the concept of Industry 4.0. Especially the group of inhabitants of the largest cities (over 200,000 inhabitants) shows the greatest knowledge about Industry 4.0. There is a need to improve educational programs aimed at preparing future engineers to operate in the conditions of Industry 4.0, as well as acquiring and developing the skills and qualifications required by Industry 4.0.*
Practical Implications: *Continuous and systematic development of knowledge about Industry 4.0 seems to be advisable, because the concept of Industry 4.0 has an increasingly strong impact on the shape of the industry and is an inherent element of Economy 4.0. This will foster the development of the necessary skills and qualifications.*
Originality/Value: *The presented results of the pilot studies showed the possibility of determining the level of knowledge about the concept of Industry 4.0 in a selected group of respondents. They allowed to identify the place of residence as one of the determinants of knowledge, opinions and attitudes towards Industry 4.0.*

Keywords: *Industry 4.0, knowledge, students, place of residence.*

JEL codes: *M15, J24, D830.*

Paper Type: *Research article.*

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1. Introduction

The economic changes taking place in the modern world require the transformation of economic entities. All this is happening as part of the next, fourth stage of the industrial revolution (Latinović *et al.*, 2019; Popkova *et al.*, 2019), known as Industry 4.0. In the United States, this concept is known as "Connected Enterprise" (Otieno *et al.*, 2017).

Modern Economy 4.0 is built on the basis of the Industry 4.0 concept. Industry 4.0 creates a new work environment and redefines engineering competences. It poses new challenges for engineers in terms of education and skills. The professional profiles and skills of employees are modified. Industry 4.0 requires new skills adequate to the technologies used. It is also a challenge for education systems. Era 4.0 employee teams are teams of people and robots. The phenomena and processes taking place within Industry 4.0 raise questions regarding the preparation of future engineers to work in the conditions of Industry 4.0, the catalog of desired engineering competences needed in the era of Industry 4.0, their assessment, as well as teaching and training.

During the empirical research, the respondents were asked to share their knowledge about the concept of Industry 4.0 and the skills it requires. General conclusions were drawn and attention was paid for moderating the obtained results by the factor of the place of residence.

2. Background

2.1 Industry 4.0

Industry 4.0 is a digital transformation of production, where automation and data exchange in production technologies are developed. It aims to build cyber-physical systems (CPS), the industrial Internet of Things, cloud computing and artificial intelligence in creating the so-called smart enterprises. Industry 4.0 (Davies, 2015) continues concepts such as: industrial Internet of Things (Sisinni *et al.*, 2018), smart industry (Haverkort *et al.*, 2017), smart factories (Grabowska, 2020), resilient factories (Schmitt *et al.*, 2017), or advanced manufacturing (Bag *et al.*, 2021). Industry 4.0 is forcing a deep transformation of business models, applying digitization, automation and robotics to production. It connects the virtual and real world. Physical and virtual reality are increasingly fusing, real people work together (also in international teams) in virtual environments.

Industry 4.0 is based on intelligent network systems and uses the Internet of Things. It uses intelligent procedures and processes to create intelligent products. The production processes are cross-linked and at the same time highly individualized. An intelligent factory operates on different principles. Communication between people, machines and resources takes place on the basis of social networks. Industry 4.0 uses the following technologies and areas: Big Data, autonomous robots, simulation, horizontal and vertical integration systems, industrial Internet of Things, cyber security, cloud computing, additive manufacturing (3D printing) and augmented reality (Rüßmann *et al.*, 2015). Therefore, Industry 4.0 solutions should be implemented in an interdisciplinary manner.

2.2 Profile of an Engineer of the Industry 4.0 Era

Industry 4.0 in practice strongly integrates people, machines, resources and processes. Despite the implementation of automation and artificial intelligence, Industry 4.0 does not aim to create enterprises in which robots replace the human factor. Thanks to Industry 4.0 solutions, enterprises are becoming different, better and friendlier workplaces. New solutions do not eliminate people from production processes, but are useful and convenient tools to improve production processes.

In line with the development trends of Economy 4.0, an innovative approach to the future development of production companies makes the role of engineers in the process of implementing the idea of Industry 4.0 becomes essential and crucial. The integration of many advanced technologies: automation, robotics, control and IT technology required a new look at the role of an engineer. It also requires care for the continuous development of engineers related to the improvement of their competences and skills.

The new global work environment created by Industry 4.0 will be automated, virtualized and networked. New working conditions based on digital industrial technologies will require a new employee profile - an engineer 4.0, with specific competences and skills adequate to the new reality.

Industry 4.0 emphasizes an interdisciplinary approach to technology that efficiently combines technical skills with extensive knowledge in the field of production management. Smart factories operate on the basis of extensive and complicated technological processes. This places demands on employees to have and continuously develop greater professional skills. Employees are increasingly required to have specialized knowledge and technological skills, combined with effective collaborative competences (Vila *et al.*, 2017).

In the face of such phenomena occurring in the economy, it is advisable to implement changes in employee teams by improving their qualifications and shaping their creative attitudes (Borowiecki *et al.*, 2021).

The future engineer of the Industry 4.0 era should equally have the so-called hard and soft skills and competences.

Hard competences and skills are related to a specific education and they are a technical nature. These include, knowledge of a specific engineering specialty and industry standards, knowledge of foreign languages, operation of specific computer programs, computer programming, design and problem solving skills, research and experimental skills, information processing etc. Appropriate documents (diplomas, certificates) confirm their acquisition and possession. Taking into account the conditions of Industry 4.0, it seems that the key competences and hard skills wanted by 4.0 engineers include: the ability to process and analyze large amounts of data from multiple sources, the ability to correctly assess their importance and credibility and draw accurate conclusions, knowledge of complex data analysis systems production, knowledge of issues related to cybersecurity, the ability to integrate control systems with IT systems.

The new conditions of Economy 4.0 also require the possession of soft skills. They include, among others communication skills, creativity, analytical thinking skills, teamwork skills, leadership skills, the ability to make decisions, the ability to understand concepts and concepts from other fields (openness to other specializations), openness to change, effective time management and coping with stress. In the modern world, they are gaining more and more importance and often determine the economic effectiveness of Industry 4.0 solutions.

In the group of skills desired by 4.0 engineers, a separate group of the so-called digital skills also deserve emphasis. These include information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), security (including digital comfort and cybersecurity competences), intellectual property issues, problem solving and critical thinking (EU Council Recommendations, 2018). They have a wide range of impact. Due to the fact that they are used both in private and professional life, they are important for all participants of the digital world, i.e. consumers and average Internet users, but also ICT specialists and employees operating modern technologies, who are required to have specific digital skills.

Economy 4.0 and Industry 4.0 show great dynamics. The new industrial environment, shaped by new technologies, is constantly changing and evolving. Students - future engineers 4.0 must meet the needs and expectations of the industry. With this in mind, education systems should be improved, and above all, education should be harmonized with new technologies. In this context, it is becoming more and more important to determine the level of knowledge and interest of technical students in new technologies related to Industry 4.0. Such studies are already conducted (Motyl *et al.*, 2017; Sertel *et al.*, 2020; Omar and Hasbolah, 2018; Łupicka and Grzybowska, 2018; Ulewicz and Sethanan, 2019). Their results present students' opinions on Industry 4.0 and analyze the priorities and expectations of students towards engineering education. They show that the knowledge of students about Industry 4.0 is still superficial, and the educational programs do not keep up with the requirements of the economy and the labor market. Industry 4.0 has great potential, but the necessary condition for its use is to create an educational offer that integrates technological issues with new skills required in the Industry 4.0 environment.

3. Research Methodology

For the effective implementation of the idea of Industry 4.0, building a high level of awareness and knowledge about it is important, especially in groups professionally related to the industry. The aim of the research was to explore the concept of awareness of Industry 4.0 in the group of respondents professionals in the area of computer science.

The aim of the research was to find out about the level of knowledge and perception of IT students about Industry 4.0. They wanted to know the attitudes towards Industry 4.0, opinions about it, willingness to act in its conditions and awareness of the importance and potential benefits of such solutions. The moderation of the obtained results by the factor in the form of place of residence was also analyzed.

The purposeful selection of the research sample was used. The group of respondents was selected due to the fact that in the future they will work in a digital work environment and will have a real impact on the efficient implementation of various types of applications and technologies in the Industry 4.0 area. This is very important because Industry 4.0 solutions are a strong factor in economic development.

The survey was conducted in a group of students of the Lublin University of Technology in December 2019 and January 2020. The group of respondents was a group of 236 students of IT full-time undergraduate studies representing all ages (1st, 2nd, 3rd and 4th year of studies). The research was dominated by 3rd and 4th year students - they constituted 74.6% of the respondents. The research tool was a structured questionnaire containing closed and open questions (14 questions of the main questionnaire and 5 questions of the record).

It was not a representative sample, but the obtained results may be the reason for a deeper interest in the selected research problem. The survey was conducted in the CAWI (Computer Assisted Web Interview) technique. It was of a pilot nature.

4. Results and Discussion

4.1 Descriptive Statistics

Table 1 presents the socio-demographic characteristics of the respondents. Men were the dominant group in the study (84.9%). Every third respondent works while studying, of which 76.6% work in the industry as a programmer, Java developer, Software Engineer, designer or moderator of websites. The inhabitants of Lublin constituted the most numerous group of respondents (33.2%).

Table 1. *Socio-demographic characteristics of respondents*

Variable	%
Age	
18–25	97.6
26–40	2.4
Sex	
Woman	15.1
Man	84.9
Professional status	
Non-working person	68.8
A working person	31.2
Place of residence	
Village	29.8
City up to 20,000 inhabitants	10.2
The city of 20-50 thousand inhabitants	7.3
The city of 50-100 thousand inhabitants	7.3
The city of 100-200 thousand inhabitants	7.3
The city of 200-500 thousand inhabitants	33.2
A city of over 500,000 inhabitants	4.9

Source: *Own study on the basis of conducted research.*

Table 2 presents information on the respondents' use of computers and the Internet. All respondents are computer owners. They also use smartphones (96.6%), smartwatches (18.5%), Tablets (31.7%), e-book readers (18.5%), mp3 players (19.5%) and video game consoles (27 , 3%). 37.6% of respondents have been using a computer for as long as they can remember, and more than half of them have been using a computer for over 10 years, for approx. 9% the computer experience is 5-10 years. Nobody has been using computers for less than 5 years.

The respondents are experienced Internet users - 57.1% have more than 10 years of Internet experience, approx. 30% have been using the Internet for over 5 years, 14.1% have been Internet users for as long as they can remember. The respondents are also active in social media - 61% of them use them for 5-10 years, 11.2% of students have been using social media for over 10 years, 12.7% of the respondents do not use social media at all.

The respondents actively use the Internet. Over 40% of them use it more than 6 hours a day. As many as 96% of respondents spend more than 3 hours on the Internet. Nobody spends less than 1 hour of online activity during the day. The activities most frequently mentioned by respondents include: searching for information on the Internet (94.1%), using social networks (85.8%), using applications that enable collaboration and sharing data, such as Google Drive, Dropbox, Skype (75, 6%), e-mail (72.7%), reading and downloading documents (66.3%), using Office applications (21.9%), and running a website or blog (6.3%).

Table 2. *Information about computers and the Internet*

Variable	%
Possession of equipment	
Desktop computer or laptop	100
Smartphone	96.6
Smartwatch	18.5
Tablet	31.7
Electronic book readers	18.5
Mp3 player	19.5
Video game console	27.3
Duration of computer use	
A month or less	0
Several months (up to 1 year)	0
1-2 years	0
2-5 years	0
5-10 years	8.8
More than 10 years	53.6
For as long as I can remember	37.6
Duration of Internet use	0
A month or less	0
Several months (up to 1 year)	0
1-2 years	0
2-5 years	0
5-10 years	28.8
More than 10 years	57.1
For as long as I can remember	14.1
Activity on social media	
I do not engage in such activity	12.7
A month or less	0
Several months (up to 1 year)	0
1-2 years	0
2-5 years	15.1
5-10 years	61
More than 10 years	11.2
Daily Internet activity	
0.5-1 hours	0
1-2 hours	3.9
3-4 hours	29.7
5-6 hours	23.9
Over 6 hours	42.4
Regular activities (performed at least once a day)	
Use of email	72.7
Using Office applications (e.g. Word, Excel, PowerPoint, ...)	21.9
Searching for information on the Internet	94.1
Reading and downloading documents from the Internet	66.3
Running a website, blog	6.3
Using applications allowing collaboration and data sharing, such as Google, Dropbox, Skype	75.6
Using social networks (Facebook, Twitter, ...)	85.8

Source: *Own study on the basis of conducted research.*

4.2 Data Analysis

In the research assumptions, the moderator - place of residence could take the following values from 1 to 7, where: 1: village, 2: city up to 20,000 inhabitants, 3: a city with more than 20 thousand. up to 50 thousand inhabitants, 4: a city with over 50,000 up to 100,000 inhabitants, 5: a city with over 100,000 up to 200 thousand inhabitants, 6: a city with over 200,000 up to 500 thousand inhabitants, 7: a city with over 500,000 residents.

One of the questions where you can see a significant impact of the place of residence on the answers provided is the question v1_2 with the following content: Have you ever heard about augmented reality?

Possible answers to the question are: 1: often, 2: sometimes, 3: sporadically, 4: rarely, 5: never.

The Table of counts for this question depending on the place of residence is presented below.

Table 3. *Results for variable v1_2 and place of residence moderator, data without aggregation*

			Place of residence							Total
			1	2	3	4	5	6	7	
v1_2	1	Count	23	1	7	1	4	30	4	70
		Row %	32.9	1.4	10.0	1.4	5.7	42.9	5.7	100.0
		Column %	32.9	3.8	35.0	6.3	26.7	38.5	36.4	29.7
		Total %	9.7	.4	3.0	.4	1.7	12.7	1.7	29.7
	2	Count	20	14	4	6	8	20	3	75
		Row %	26.7	18.7	5.3	8.0	10.7	26.7	4.0	100.0
		Column %	28.6	53.8	20.0	37.5	53.3	25.6	27.3	31.8
		Total %	8.5	5.9	1.7	2.5	3.4	8.5	1.3	31.8
	3	Count	10	3	2	4	2	16	3	40
		Row %	25.0	7.5	5.0	10.0	5.0	40.0	7.5	100.0
		Column %	14.3	11.5	10.0	25.0	13.3	20.5	27.3	16.9
		Total %	4.2	1.3	.8	1.7	.8	6.8	1.3	16.9
	4	Count	6	5	4	4	1	9	1	30
		Row %	20.0	16.7	13.3	13.3	3.3	30.0	3.3	100.0
		Column %	8.6	19.2	20.0	25.0	6.7	11.5	9.1	12.7
		Total %	2.5	2.1	1.7	1.7	.4	3.8	.4	12.7
	5	Count	9	3	3	1	0	5	0	21
		Row %	42.9	14.3	14.3	4.8	.0	23.8	.0	100.0
		Column %	13.2	11.5	15.0	6.3	.0	5.5	.0	8.9
		Total %	3.8	1.3	1.3	.4	.0	2.1	.0	8.9
Sum		Count	70	26	20	16	15	78	11	236
		Row %	29.7	11.0	8.5	6.8	6.4	33.1	4.7	100.0
		Column %	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: *Own study on the basis of conducted research.*

As can be seen in the Table above, there are sample sizes that are less than 5, which makes the chi-square test impossible. Therefore, it was necessary to aggregate data in relation to the place of residence. The following values of the place of residence have been established: 1: village, 3: city up to 200,000 inhabitants, 6: a city with over 200,000 residents.

Table 4. *Pivot Table for variable v1_2 and place of residence moderator (aggregated data)*

			Place of residence			Total
			1	3	6	
v1_2	1	Count	23	13	34	70
		Row %	32.9	18.6	48.6	100.0
		Column %	33.8	16.9	37.4	29.7
		Total %	9.7	5.5	14.4	29.7
	2	Count	20	32	23	75
		Row %	26.7	42.7	30.7	100.0
		Column %	29.4	41.6	25.3	31.8
		Total %	8.5	13.6	9.7	31.8
	3	Count	10	11	19	40
		Row %	25.0	27.5	47.5	100.0
		Column %	14.7	14.3	20.9	16.9
		Total %	4.2	4.7	8.1	16.9
	4	Count	6	14	10	30
		Row %	20.0	46.7	33.3	100.0
		Column %	8.8	18.2	11.0	12.7
		Total %	2.5	5.9	4.2	12.7
	5	Count	9	7	5	21
		Row %	42.9	33.3	23.8	100.0
		Column %	13.2	9.1	5.5	8.9
		Total %	3.8	3.0	2.1	8.9
Sum		Count	68	77	91	236
		Row %	28.8	32.6	38.6	100.0
		Column %	100.0	100.0	100.0	100.0
		Total %	28.8	32.6	38.6	100.0

Source: *Own study on the basis of conducted research.*

The results of the chi-square independence test are presented in the Table 5.

Table 5. *Pearson Chi-square results for variable v1_2*

	Values	Df	Asymptotic Sig. (2-tailed)
Pearson Chi-square	16.92	8	0.031
Likelihood ratio	17.30	8	0.027

Source: *Own study on the basis of conducted research.*

It can be noticed that for the number of degrees of freedom df = 8 and the adopted probability level p = 0.05, the critical value of the chi-square distribution is 15.51. In the case of the variable v1_2, the distribution value is higher, so the results are statistically significant for the significance level p = 0.05.

Analyzing the results from Table 4, we can say that over 60% of respondents have heard about the concept of augmented reality, including 29.7% - often and 31.8% - sometimes. Only 8.9% of respondents have never heard of augmented reality. It can be noticed that people residence in the countryside heard this term less often, because it constituted 9.7% and 8.5% of the answers often and sometimes, respectively. As opposed to city dwellers, who constituted it: for cities up to 200,000 inhabitants 5.5 + 13.6 = 19.1%, and for cities with more than 200 thous. 14.4 + 9.7 = 24.1%. Another question where the results are statistically significant is v1_5 with the following content: Have you ever heard of 3D printing ?

The numbers for this question depending on the place of residence are presented in Table 6.

Table 6. *Results for variable v1_5 and place of residence moderator*

			Place of residence			Total
			1	3	6	
v1_5	1	Count	50	52	70	172
		Row %	29.1	30.2	40.7	100.0
		Column %	73.5	67.5	76.9	72.9
		Total %	21.2	22.0	29.7	72.9
	2	Count	15	17	13	45
		Row %	33.3	37.8	28.9	100.0
		Column %	22.1	22.1	14.3	19.1
		Total %	6.4	7.2	5.5	19.1
	3	Count	1	7	2	10
		Row %	10.0	70.0	20.0	100.0
		Column %	1.5	9.1	2.2	4.2
		Total %	.4	3.0	.8	4.2
	4	Count	0	1	5	6
		Row %	.0	16.7	83.3	100.0
		Column %	.0	1.3	5.5	2.5
		Total %	.0	.4	2.1	2.5
	5	Count	2	0	1	3
		Row %	66.7	.0	33.3	100.0
		Column %	2.9	.0	1.1	1.3
		Total %	.8	.0	.4	1.3
Sum		Count	68	77	91	236
		Row %	28.8	32.6	38.6	100.0
		Column %	100.0	100.0	100.0	100.0
		Total %	28.8	32.6	38.6	100.0

Source: *Own study on the basis of conducted research.*

The results of the chi-square independence test are presented in Table 7.

Table 7. *Pearson Chi-square results for variable v1_5*

	Value	Df	Asymptotic Sig. (2-tailed)
Pearson Chi-square	16.50	8	0.036
Likelihood ratio	17.73	8	0.023

Source: *Own study on the basis of conducted research.*

The chi-square test confirmed the statistical significance of the results (Table 7). When analyzing the data from Table 6, it can be seen that the vast majority of respondents have heard about 3D printing (72.9% + 19.1% = 92%).

For this variable, the differences in the results are not as large as before. Nevertheless, the largest group that has often heard about the concept of 3D printing are residents of large cities (over 200,000 inhabitants) and it is 29.7% of all respondents.

Another variable where there are statistically significant differences depending on the place of residence is the variable v3_1 (question: Do you think the term Industry 4.0 includes the application of changes in the concept of the organization of the enterprise value chain?) Possible answers are: 0: no, 1: yes. Table 8 is the count Table for this variable depending on the place of residence.

Table 8. *Results for variable v3_1 and place of residence moderator*

			Place of residence			Total
			1	3	6	
v3_1	0	Count	57	53	77	187
		Row %	30.5	28.3	41.2	100.0
		Column %	83.8	68.8	84.6	79.2
		Total %	24.2	22.5	32.6	79.2
	1	Count	11	24	14	49
		Row %	22.4	49.0	28.6	100.0
		Column %	16.2	31.2	15.4	20.8
		Total %	4.7	10.2	5.9	20.8
Total		Count	68	77	91	236
		Row %	28.8	32.6	38.6	100.0
		Column %	100.0	100.0	100.0	100.0
		Total %	28.8	32.6	38.6	100.0

Source: *Own study on the basis of conducted research.*

The results of the chi-square independence test are shown in Table 9.

Table 9. *Pearson Chi-square results for variable v3_1*

	Value	Df	Asymptotic Sig. (2-tailed)
Pearson Chi-Square	7.54	2	0.023
Likelihood Ratio	7.22	2	0.027

Source: *Own study on the basis of conducted research.*

The results presented in Table 8 show that respondents strongly deny that the term Industry 4.0 includes the application of changes in the concept of the organization of the value chain of enterprises, which is not true and should be treated as a lack of relevant knowledge among the respondents. An interesting relationship can be seen among the respondents who correctly answered this question, over 16% of the respondents were city residents.

Another question under analysis is v3_4: Do you think the term Industry 4.0 includes activities promoting energy efficiency and decentralization of decision making? Possible answers are: 0: no, 1: yes. The Table of numbers for this question depending on the place of residence is presented below (Table 10).

Table 10. *Results for variable v3_4 and place of residence moderator*

			Place of residence			Total
			1	3	6	
v3_4	0	Count	47	69	74	190
		Row %	24.7	36.3	38.9	100.0
		Column %	69.1	89.6	81.3	80.5
		Total %	19.9	29.2	31.4	80.5
	1	Count	21	8	17	46
		Row %	45.7	17.4	37.0	100.0
		Column %	30.9	10.4	18.7	19.5
		Total %	8.9	3.4	7.2	19.5
Total		Count	68	77	91	236
		Row %	28.8	32.6	38.6	100.0
		Column %	100.0	100.0	100.0	100.0
		Total %	28.8	32.6	38.6	100.0

Source: *Own study on the basis of conducted research.*

Table 11. *Pearson Chi-square results for variable v3_4*

	Value	Df	Asymptotic Sig. (2-tailed)
Pearson Chi-Square	9.73	2	0.008
Likelihood Ratio	9.74	2	0.008

Source: *Own study on the basis of conducted research.*

The results presented in Table 10 show that respondents also do not know that Industry 4.0 includes measures that favor energy efficiency and decentralization of decision making. Among the respondents who answered correctly, 8.9% lived in rural areas, 3.4% in cities up to 200,000. inhabitants, and 7.2% in cities with more than 200 thousand.

5. Conclusions

The conducted research has shown that the knowledge about Industry 4.0 among IT students is quite superficial. The problematic area is even defining the concept of Industry 4.0 - respondents are not able to provide all thematic areas related to this concept.

Therefore, if we want to develop Economy 4.0, we should intensify educational activities on Industry 4.0, awaken the need to use its solutions and create educational programs enabling the acquisition of practical skills in this area. Future 4.0 engineers should have appropriate knowledge and represent new attitudes. They should be sensitized to Industry 4.0 issues through appropriate educational programs, seminars and workshops, so that at the threshold of their professional life, they have the appropriate substantive preparation to function in the Industry and Economy 4.0 environment and strive to use such solutions in future workplaces.

The conducted analysis shows that there is a diversification of knowledge and perception of Industry 4.0 according to the criterion of the respondents' residence. There is a regularity that shows a higher level of knowledge about Industry 4.0 among the inhabitants of larger towns.

This indicates the legitimacy of differentiating educational campaigns on Industry 4.0 depending on the size of the city.

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