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Industry 4.0: A Chance or a Threat for Gen Z? The Perspective of Economics Students

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Abstract: Major transformations in the sphere of the economy that Industry 4.0 brings are also reflected in young people's expectations regarding the development of their professional career. Existing social relations are being modified nowadays and new concepts of building them are being developed. The aim of the present article is to present the expectations, fears and hopes of young people related to the course of Industrial Revolution 4.0 in the context of their future life. For a simpler perception of the research objectives of students, the research was narrowed down to the topic of building relationships with robots, which are one of the pillars of Industry 4.0. The research methods are based on the literature studies and an experiment conducted among the students graduating from economic faculties and entering a strongly changing labour market. The experiment was qualitative. The students wrote a short essay on the topic of whether a friendship between a human and a robot is possible. One group of students was shown a short emotional clip about the relationship between the boy and the robot. Regardless of the attempt to influence the message with a film, both groups of students hardly noticed the negative effects of digitisation on building relationships and social trust. The relationship between human being and advanced technology will develop in the future, which will result in the emergence of new relationships between humans and artificial intelligence.

Keywords: Industry 4.0; robotisation; higher education

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1. Introduction

A large part of the research is currently devoted to the issues of the Fourth Industrial Revolution. They are predominantly devoted to the possibilities of increasing management efficiency, including the use of time and resources [1–4]. Contemporary socio-economic changes and the related challenges of the 21st century, also in the social sphere (e.g., aging, unemployment, income and property inequalities, poverty and social exclusion, discrimination, migration), entail searching for new, economically and socially rational solutions to social problems [5,6]. Nowadays, strengthening and using social capital and solidarity are essential to increase the competitiveness of the economy [7]. One of the tasks of the economy is to generate ways to reduce the scale of social problems, the solutions to which are not guaranteed by the market or the state. The authors of the article decided to limit the research tasks to the issue of the impact of automation and robotisation of production and services on positive social changes and sustainable development. This was decided due to the pilot nature of the research, which, in the near future, will be expanded both in terms of the scope of questions and the number of respondents.

Technological progress, which inevitably accompanies human development, has an impact on both social and economic life. The large transformations in the economic sphere brought about by Industry 4.0 are also reflected in career planning by young people—existing relationships are being modified and new concepts are being developed [8,9].

The aim of the present article is to present the expectations, fears and hopes of young people related to the course of Industrial Revolution 4.0 [10]. The review of the literature

has shown a gap in the study of Gen Z's attitude to Industrial Revolution 4.0. It seems that the research gap includes, among other things, the identification of attitudes towards this issue, especially among young people who are about to start their professional careers [11].

In the first part of the article, we review the literature of researchers from different parts of the world. Then, we describe the research method and the group of study participants, discussing the conclusions published in the works of foreign authors, and, finally, the article ends with the conclusions of our study.

2. Literature Review

Industry 4.0 involves the integration of intelligent machines, systems and the introduction of changes in production processes to increase production efficiency and the possibility of flexible product range changes. As previously mentioned, the scope of research among students was narrowed down to the topic of building relationships with robots. Human–machine collaboration, including robots and cobots, is just one of the Industry 4.0 paradigms. Here, in order to provide a broader perspective, the concept of Industry 4.0 is also be analysed in its other areas.

Industry 4.0 is not only about technology, but also about new ways of working and the role of people in the industry [12]. Since the 1950s, when the first industrial robot was used, the robotics market has been characterised by continuous development and sales growth. Companies compete with each other in the quality of the robots offered, as well as the speed and precision of their operations. Tasks performed in unfavourable working conditions, the need for high efficiency and accuracy of execution, as well as increasing customer requirements, increase competition and thus the expenditure on innovation and technology, including robotics. The associated costs require the minimisation of inputs, which involves the replacement of repetitive and mechanical human labour. The global increase in demand for industrial robots is clearly reflected in the statistics [13]. The use of artificial intelligence by machines and robots to perform complex tasks is the basic principle of smart factories and Industry 4.0. Artificial intelligence technologies permeate the manufacturing industry and connect the physical and virtual worlds through cyber-physical systems [14]. Human interactions with artificial intelligence is currently one of the basic goals of Industry 4.0 [15].

According to the International Federation of Robotics (IFR), sales of industrial robots have been steadily increasing over the past five years (ifr.org). According to IFR experts, approximately 290,000 robots were to be installed on the world's production lines in 2016, an increase of 14%. Similar statistical data were published by Technavio in the report on forecasts for the development of the global robot market in 2015–2019. According to IFR data, 2017 was a record year in terms of an increase of +31% in the number of robots delivered. It is estimated that by 2020, there will be more than 3 million industrial robots in operation, of which approximately 1.9 million will be in Asian factories (mainly in China and Korea). In 2016, China overtook Japan in terms of the number of robots, which amounted to 340,000. It is estimated that in 2020 there will be 950,000 industrial robots in China and this number will be three times higher than the number of robots in Japan [16]. Despite the decline in development during the pandemic period until 2025, the global robotics market could exceed USD 61.4 billion, with a growth rate of 8.5% [17].

The issues of the impact of the industrial revolution on the development of entrepreneurship are the subject of the research conducted by teams of scientists in many countries. When considering how mechanical progress can be used to solve social problems, mechanical development itself should also be considered as a social process. This approach is presented, among others, by the authors of studies on the impact of Industrial Revolution 4.0 on social development [18]. Contemporary weaknesses in the development of Industry 4.0 are mainly related to the human factor. The new development model assumes complex interactions between human beings and machine. This perspective raises challenges related to human resistance to accepting the machine as a partner in the performance of work [19]. However, change and the transition to Industry 5.0 seems inevitable [20,21].

Human identity and the meaning ascribed to human beings have been shaped throughout human history. Nowadays, humanity is linked to new technologies and the emergence of new human–technology relationships. This is particularly important in today's society, where the development of digital culture and human improvement technology allow for the creation of the human–technology relationship. These relations call into question traditional concepts of human nature and what it means to be human [22–24]. New digital technologies improve human functioning by offering unique opportunities to improve the human condition by expanding human capabilities and practices in life and society [25–28]. The aspect of the human–machine relation in terms of feedback interaction is of particular importance [29–31].

An important review of how the ubiquity of technology has led to a monumental change in human evolution (a change in language, thoughts and feelings) is presented by Erica Orange [32]. The author says that the relationship between human beings and technology will undoubtedly change the way we define what it really means to be human. As systems, networks and programmes become increasingly complex, our ability to connect to those machines that play such an important and vital role in our daily lives is becoming increasingly difficult [33]. Once human beings ruled, who were able to manipulate machines to obtain the desired effect. At the time of the Fourth Industrial Revolution, these roles were reversed and it is becoming increasingly difficult to determine where power and control are ultimately located. As a consequence, our ability to manage machines and robots will become weaker. The intimate connection and interaction between human intelligence and machine intelligence has undoubtedly influenced the human experience and our process of self-identification [32,34,35].

The paradigms of Industry 4.0 are thoroughly analysed by Marzano and Martinov [36]. The elements characterising Industry 4.0 include: M2M chips (machine-to-machine), large data sets, artificial intelligence and the Internet of Things. In an Industrial 4.0 environment, intelligent machines communicate with each other, manage production lines, and analyse and solve production problems with minimal human involvement. Industry 4.0 and smart factories are terms that are often used as synonyms. The goal of a smart factory is flexible and fast production, dynamic reconfiguration and the optimisation of production depending on changes in the business model and consumer behaviour. Machine learning, on the other hand, refers to an ability that machines have to learn and improve themselves through artificial intelligence, without an explicit command or programming [36–40].

As it is commonly accepted, one of the pillars of the fourth industrial revolution is cybernetic systems, which combine computer systems, software and people in work processes. The examples of such systems are self-learning robots, preventive maintenance technologies, self-reconfiguring machines and intelligent environmental protection technologies [41–44].

3. Materials and Methods

The rationale for the experiment is a reference to the economic studies programme. The experiment occurred during classes on the subject of "Diagnostics of ergonomic systems". It was considered that an interesting and useful research task would be to identify the possibilities of building social relations between a human being and a robot.

The authors of the research assumed that the aspect of building social relations can and should also be examined in the example of a human–machine relationship. The aim of the research was to determine whether, from the perspective of the Fourth Industrial Revolution, social relations can be built with robots and the role of robots in building bonds, trust and social capital. For the purpose of this research, it was considered appropriate to apply a qualitative approach using experimentation.

An experiment is a method of scientific investigation of a specific section of reality, which consists of inducing or only changing the course of processes by introducing a new factor to them and observing the changes that occur under its influence. Due to their specificity, the research problems appearing in analyses of a social nature are often of a

qualitative nature. For example, 68% of empirical articles devoted to the issue of place marketing, published between 1976 and 2016 in 98 English-language magazines, were qualified as prepared in the formula of qualitative research, 28 as quantitative and 4 as mixed [45]. The authors considered that the right research task would be to learn the opinions of young people entering the changing labour market. The current students of economics will, in a few years' time, be the beneficiaries of the implemented solutions or, to a greater or lesser extent, feel their effects.

The aim of the present research was to find out what young people expect from the Fourth Industrial Revolution. The experiment involved 60 students of economics in the third (last) year of undergraduate studies. The study was conducted in February 2022.

The experiment consisted of collecting students' statements on the impact of Industrial Revolution 4.0 on the relationships between people and between people and machines. In order to arouse the interest of the students, they were shown a short film (a music video by the famous artist Zamilska). The plot of this movie shows an interesting way in which a young boy names a relationship with a robot. The boy is initially wary of a machine that plays with a screwdriver during a break at work. The tool falls out of the robot's "hand" beyond its reach. The robot is helpless in this situation. The boy overcomes his fears and helps the robot by giving him a screwdriver. To his surprise, the robot gives him a gift in the form of a robot mascot as a thank you. The described film was an introduction to the actual qualitative research, consisting of recording students' thoughts on the aforementioned topic.

The students responded to the problem of whether a friendship between a human being and a robot is possible. Half of the respondents were first shown a short video presenting the process of building a positive relationship between a boy helping a robot pick up a screwdriver. The tool fell on the floor and was out of reach of the machine. The powerlessness of the machine was met—despite the boy's initial concerns—with his positive response. He decided to help the robot. Giving him a screwdriver was rewarded with a gift in the form of a mascot (miniature) of the robot.

The remaining 30 respondents were asked to comment briefly on the possibility of making friends with a robot, but without watching the film earlier. For the proper course of the experiment, the same number of students (18 women and 12 men) participated in the study in both groups.

In qualitative methods, a variety of problems related to research questions are undertaken. Qualitative methods work best as exploratory research that aims to present the diversity of phenomena through deep and thorough analysis. On the contrary, the pursuit of a numerical description of reality is a function of quantitative research.

Qualitative research is not based on a standardised measurement tool, such as a questionnaire or a questionnaire with closed-ended questions, but is oriented more towards a free and less formalised way of obtaining information. Qualitative research scenarios are usually created only to define a list of issues or key guidelines that can be addressed by the moderator during the study.

A significant difference between the qualitative and quantitative methods is the selection of the sample, which must be purposeful in the qualitative research. The respondents selected for the survey, being a group much smaller than in the case of quantitative surveys, usually have to meet strict criteria. All the students selected for the research were in their final year of study and their curricula included subjects thematically linked to the research, such as ergonomics or knowledge management. The differences between the two types of research methods are summarised by K. Konecki: "There is no fundamental contradiction between the methods and qualitative and quantitative data when we consider them on a technical and neutral level. Only the goals of using these methods, and thus the interests behind them, the scientific biography of the researcher and the types of materials they are looking for to build their theory, i.e., the general research perspective, determine the meaning and relations of these methods" [46].

4. Results

The participants of the study were asked whether it is possible to make friends with a robot and about the positive expectations related to Industrial Revolution 4.0. The interview also raised the concerns of the respondents related to the technological revolution. They were also asked about the direction (positive, neutral or negative) of the impact of Industrial Revolution 4.0 on the development of social relations, focusing on the topic of building the relationship of a human being working with robots.

Among the respondents in the first group (with an introductory film screening), the vast majority (25) stated that such a friendship was possible. A total of three people presented a negative answer and two people were undecided. It is worth noting that the negative answers were given only by men, while the undecided ones by women.

We analysed the collected statements of the respondents and compared the results between the two groups participating in the study. In the group of students who were not invited to watch the introductory movie, compared to the first group, only two more people (one woman and one man) reported a negative attitude to the possibility of establishing a positive relationship with machines.

In the following section of the article, the results of the conducted interviews are presented in synthetic terms. The responses of the respondents are grouped into three categories corresponding to their approach to the phenomenon of progressing technology development (determined and moderate sympathisers, undecided people and sceptics).

The results of the experiment show that the participating young people—regardless of watching the film—have a positive attitude to the topics discussed. There were no significant differences in the students' responses from both groups of respondents. The experiment showed that it should be presumed that the young generation (all students were aged 22–23 years) is so familiar with modern technologies that they hardly notice any negative effects of digitisation on building relationships and social trust. It should be recalled that this is the generation that has been in contact with devices, such as smartphones or tablets, ubiquitous Wi-Fi or GSM networks, since childhood, if not since birth.

The positive attitude of respondents to the progressing digitisation and technological development in other areas of life is connected, firstly, with the conviction that human beings are somehow forced to "make friends" with new technology. People who have one occupation for "all their lives" and are replaced at some point—overnight—by machines experience a kind of crisis, although people in the 21st century must be ready for change and reshaping. You cannot be stability-oriented, but you have to be ready for changes (acceleration of changes) [47]. Technology allows us to achieve ever-greater development. A large part of the machines make it easier for people to work and even create jobs. The only constant in life is change. A man who can adapt, understands the needs and dynamics of our times and is a great candidate for various jobs. As one of the students stated, the implementation of solutions that facilitate work is the prospect of a calmer sleep for employees of technical services, and for managers who manage the enterprise, the risk of unreasonable costs without a guarantee of return.

According to some respondents, friendship with a robot can be an interesting experience in human life. One student who works with a robot on a daily basis used the phrase "that she gets along well with it". In her opinion, robots are an important part of our civilisation and make it easier for human beings to perform a lot of tasks, although they should be closely supervised.

The research was conducted during the pandemic, when lectures at the university were still held remotely. Therefore, an online questionnaire was used on the Moodle e-learning platform. The survey contained three closed questions: Can you make friends with a robot? Do you have positive expectations for Industrial Revolution 4.0? Do you have concerns about Industrial Revolution 4.0? For each of the questions, the online form provided the possibility of adding an additional comment. This possibility was used by a total of 26 people in both study groups. Their comments are presented in the section below. The introductory video, watched by only one of the two study groups, lasted 3 min.

Subsequently, the students had 30 min to answer the questions (10 min for each question). A synthetic summary of the research results is presented in Table 1.

Table 1. Synthetic summary of research results.

Defining the Research Group	The Respondents Watched an Introductory Video before the Survey			The Respondents Did Not Watch the Introductory Video before the Survey		
(1) Is friendship between humans and robots possible?	Yes	No	Undecided	Yes	No	Undecided
Women	15	2	1	13	3	2
Men	10	1	1	9	2	1
Sum of responses	25	3	2	22	5	3
		30			30	
(2) Do you have positive expectations of Industrial Revolution 4.0?	Yes	No	Undecided	Yes	No	Undecided
Women	16	1	1	13	2	3
Men	10	1	1	8	2	2
Sum of responses	26	2	2	21	4	5
		30			30	
(3) Do you have concerns about Industrial Revolution 4.0?	Yes	No	Undecided	Yes	No	Undecided
Women	11	5	2	14	1	3
Men	9	2	1	10	1	1
Sum of responses	20	7	3	24	2	4
		30			30	

Source: own research results.

Some of the respondents believed that the fear of losing a job was not a reason for adopting a negative attitude towards robotisation. According these respondents, people will soon be "sharing the planet Earth with robots", but that should not be a reason for fear. The skills that employers will be looking for will change, and some jobs will no longer be as necessary as before. In their view, change is inevitable and robots do not have to be intruders, but they will make it easier for us to perform our duties and relieve us of the burden of many activities. In order to like a robot, one should first get used to it, and only then build "relations" with it. The positive aspects of the existence of robots and forming a friendship with them should be emphasised, and not only focus on the negative aspects.

Another group of respondents stated that forming a friendship with a robot is not only an opportunity, but rather an obligation for human beings. Robots are machines created by humans for humans. However, they should serve us, not dominate or replace us.

Robots are more useful and nicer than people to each other. They are able to relieve people of many difficult tasks and do not feel any discomfort in difficult working conditions. However, man will always be needed to control the work of robots.

According to the sceptics, robotisation brings many benefits to people—saving time and energy, increasing labour productivity and other opportunities that we do not even know yet. The positive expectation of the industrial revolution is that robotisation can contribute to increased safety at work and allow for the development of new skills and reduce stress caused by monotony at work. Among their fears, sceptics mention the areas in which technology fails. An unforeseen failure has serious consequences, and a person—through inattention or lack of competence—can lead to a situation that affects others. Another concern is the fear of losing workplaces, for example, if we entrust the work conducted by 50 people to 1 robot, it will be difficult to offer these people other jobs. Regarding friendship with a robot, sceptics have heard about cases in which a robot was able to replace a human being with the presence of another person and this sounded terrifying to them.

Among the undecided individuals, the dominant belief is that human–robot cooperation should occur without crossing certain boundaries. A current example is Google Assistant (for Android users) or Siri (for iOS users). They allow you to move effortlessly

through your whole phone and make your life easier. The voices that are generated by these systems have a positive tone because they are not impersonal. This way of perceiving the world of artificial intelligence shows that students appreciate the role of the humanisation of work, which brings many benefits to employees, managers and entire enterprises.

However, when we are discussing a more "personalised" version of a robot that is close to a human being, it was emphasised that making friends with such a machine does not lead to anything good. Those who are sceptical about increasing the role of modern technology in the work process think that, at first, displaying affection for robots may seem to be an interesting concept, but in the end it can do more harm than good. The advantages of technological progress include the improved functioning of hospitals, operating theatres and better disease diagnoses. Sceptics of rapid technological progress have many concerns about the social impact of this process. According to them, digitisation can lead to greater alienation, depression and obesity in society. Many people lose their jobs or move to remote workplaces, which is not a good thing in the long run. In addition, cybercrime and theft of personalities and assets will become increasingly popular. The increasingly widespread use of intelligent houses can cause many problems, such as paving the way for hackers.

Among the threats posed by the development of robotisation is the fear that existing workers will be made redundant or not available to new job applications. It is likely that the various processes will soon be even more automated than before, but that does not mean that human beings are no longer needed. It should not be forgotten that people, even though they take more time and effort to perform their job than a robot, are able to detect errors that are their fault or those of a robot and correct them. An example of modern and human-friendly robots mentioned by students are cobots—a new trend in robotics. These are robots used for direct cooperation with humans, supporting them in physical, precise or dangerous work. They are becoming cheaper to buy and maintain, safe to use and easy to use and programme. Thanks to modern technologies, operators without any programming experience can quickly set up and use them. It is also an area for the formation of new companies with innovative products.

Despite the fact that science and technology are not currently developed enough to completely replace humans, the machine is largely capable of handling them, which is particularly beneficial in conditions of dangerous or monotonous work that does not bring any value to humans. A robot does not get tired, but sometimes it also needs help. The research shows the belief that a human and a robot can become friends with each other to be able to rely on and complement one another. Hence, instead of being afraid of robots, one must prepare to build an atmosphere of mutual trust.

Some of the respondents observe no problem in establishing a positive relationship with a robot. Nowadays, forming a friendship with a robot does not resemble science fiction anymore. You can already find various forms of support in everyday life (an example of this is the increasingly popular childcare assistant) [48]. Easy access to artificial intelligence opens up the access to entertainment without the participation of third parties, discouraging the millennials who are connected to the Internet almost all day, to from pro-social contact with people.

Studies show that we tend to observe robots as being more human than they really are, which means that human beings can learn to build relationships not only with other people and other living beings, but also with machines. Thus, robots can be an alternative for people who need help and can serve as a companion and form of support in their illness. Robots can make work easier and reduce a person's responsibilities so that they can devote more time to their relatives and friends. Nevertheless, the respondents noted that such a machine only performs functions previously programmed by its designer.

According to some respondents, a specific vision of the future prevails, in which humans will have to share the Earth with machines. Machines are often viewed as smarter than humans. People often fear that a robot will replace them and make them unemployed in the future. However, it is worth adopting a different perspective, in which the robot does

not have to be an intruder, but—on the contrary—can significantly facilitate our duties and relieve us in many activities.

Most of the respondents understand that automation and robotisation make certain jobs easier and allow individuals to optimise working times, which is very beneficial. Nowadays, technology is developing at a dizzying pace; often, even the young generation is unable to keep up with technological progress. Humanity faces many important decisions related to, among other things, the development of artificial intelligence (AI). To know what AI is, you first need to understand the operation of the machine or computer operating system. It is not an element acquired by the machine itself; it is introduced by man. Most of the systems are intended to imitate certain actions or to perform previously introduced algorithms by the developer, but one of these algorithms may also be the introduction of new and improved algorithms by the machine itself. Machines are already capable of predicting the working environment or events. It is one step for a robot to imitate human thinking and thus anticipate it, by combining various elements together and matching them with an algorithm. However, people are still unable to predict the emotions that guide them. Therefore, it is currently not possible to introduce an algorithm that will teach the machine this. As one of the students stated, even the best technology may turn out to be useless if it meets resistance from its users.

Similarly, in the situation of a machine and a human being, where the machine is devoid of feelings, it is distinguished by its speed of operation, resistance to the conditions of the external environment and the ability to perform many operations at the same time. While a human being is distinguished by certain features, such as intuitive operation, the ability to act in unexpected and unlikely situations; the detection of signals from the external environment through sight and hearing; and the detection and correction of errors, not only one's own, but also the machine's. Many cases in nature show that some relationships between two beings are based on the complementarity of characteristics that one individual does not possess while the other one does. Such symbiosis is possible between a human being and a machine, which can be the basis of "friendship" between them. By acting together, a human being and a machine reduce or completely eliminate their weaknesses, so that their potential is fully exploited and the relationship between them is more beneficial.

In the near future, a machine may become similar to a human brain. A machine, while improving its algorithms, can give the impression of independent thinking. Friendship between a machine and a human being is possible, but as a complement to each other. A human being can also talk to a machine, but nowadays this conversation is based on the data available to the machine and not on feelings and independent thinking. However, through the rapid development of technology, the boundary between a human being and a machine can be blurred at any time.

5. Discussion

Answering the question posed in the introduction, referring to the issue of whether Industrial Revolution 4.0 is an opportunity to develop social relations, the authors stated that the studies in the literature and their own research have brought them significantly closer to believing in the truth of such a thesis. The pursuit of innovative technologies to increase productivity can be used to improve the welfare and social needs of the global population.

Referring to the results of the literature research, it should be noted that the results of the authors' research are consistent, inter alia, with the conclusions of the research conducted by Kai Hockerts (Copenhagen Business School). This is to say that entrepreneurship education can increase students' willingness to start up enterprises through a process of learning by experience, in which students contribute to the community of practice. The data collected from 175 course participants to choose from a Master's level indicate that participation in entrepreneurship courses increases students' self-esteem [49]. Students surveyed for this publication also presented an entrepreneurial approach to their life plans. Some plan to start their own business, and the industrial revolution is an opportunity for them to demonstrate their business competences developed during their studies.

As Buhr [50] emphasises, Industry 4.0 still has to prove its benefits to society. Only when developments in this area actually result in social added value (e.g., decent work or a new quality of work) and when social practices are "better for people" can the nature of social innovation actually be achieved. Innovation occurs for consumers and the supply side as well as workers in the smart factories of the future. This can only occur if Industry 4.0 is understood in terms of both social and technical innovations. The results of the studies involving students correspond to this approach. The positive side of the research is that students appreciate the need to develop direct interpersonal relations so that the organisation of work is not only in technical relations with machines.

The study conducted in Mexico determines that entrepreneurship is an essential competence in higher education, but research in this area is in an early stage. These researchers assessed competencies in the field of entrepreneurship and identified the factors and educational processes that favoured its development. The research was conducted using a mixed method: surveys, interviews with professors and a focus group with students [51].

As the research results show, people have all sorts of fears and prejudices. The point of view is also important: managers will insist on the Fourth Industrial Revolution to reduce the costs of production activities. On the other hand, ordinary employees are afraid of dismissal. This divergence of goals may be a factor inhibiting innovation. Therefore, it becomes important to understand these goals and take them into account in the implementation planning process.

The studies of Morrar, Arman and Mousa confirm the importance of the duality between social and technological innovations, which can only be achieved if Industry 4.0 is recognised as an opportunity to transmit technical and social innovations. The discussion on innovation in the context of Industry 4.0 sheds light on the bright side of its potential, instead of focusing on the potential dark side of job loss, the replacement of people by technological innovation, the end of privacy and the potential loss of control. The social perspective shows that technical innovation can positively influence the diffusion of social innovation. The technological revolution that accompanies Industry 4.0 achieves its true potential in combination with innovation. Therefore, companies that succeed in Industry 4.0 will be those that offer both social progress and economic benefits [12]. Research on the students has shown the need for further analyses of the scope and depth of changes in the impact of artificial intelligence on the implementation of the goals of sustainable development of societies.

The research conducted by the Polish Industry Development Agency in 2019 shows that 80% of the surveyed suppliers will increase the sales of industrial robots and manipulators over the next year, mainly as a result of staff shortages and rising costs related to the employment of workers. In the opinion of the remaining 20% of the respondents, the sale will remain unchanged, mainly due to the reluctance of investors, lack of support for investment by the state and lack of awareness of possible profits [16].

Nevertheless, however wise our factories become, human labour will always be crucial to their success [52]. In their statements, the students emphasised that robots can never harm a person or allow a person to suffer any harm while working with them.

6. Conclusions

The present study allowed us to verify the approach of students to the role of a human in the work process, previously discussed during lectures. The experiment showed that changes in the organisation of work, which are a consequence of Industrial Revolution 4.0, require greater emphasis in the study programmes of economic faculties.

The results of the experiment do not show any significant difference in the attitude of young participants of both groups to the possibility of building social relations with robots. As it was mentioned, in the group of students who were not invited to watch the introductory film on the topic, compared to the first group, only two more (one woman and one man) reported a negative attitude towards the possibility of establishing a positive relationship with the robots.

The research shows that technology cannot function without human beings and their thoughts. Modern technologies are the result of human creative effort and should always serve people.

Trying to find out the reasons for the irrelevance of the impact of the film presentation on the responses of the research participants, the authors indicated young people's strong adaptation to the living conditions in a world of modern technology and the progress of technical and cybernetic development. They have been online since childhood and cannot imagine how it felt—not so long ago—to survive a day without access to Wi-Fi. Contrary to the representatives of older generations, the process of learning to use these devices is somewhat "natural" and is not difficult for them.

It does not change the fact that people play a decisive role in running an industrial plant. Technology can only complement human activities, replacing people in jobs where human involvement is too costly, ineffective or dangerous. The human mind is a valuable tool, so if it is possible to save this extraordinary resource, it is worth considering the automation of certain activities.

The conducted experiment, although it was a pilot and requires further research, confirmed the validity of adopting a positive perspective about the future. Industry 4.0 still has to prove its benefits to society and only when the development of Industry 4.0 brings social added value, when new technologies, regulations, services and organisations become settled in the society and when these social practices prove to be "better for people", will we recognise and adapt Industry 4.0 [53].

For this purpose, it is necessary to create an open and inspiring forum for the exchange of knowledge and experience among the representatives of various environments, namely, academics, practitioners, entrepreneurs, representatives of local communities and government authorities, people starting their research careers, doctoral students and student research clubs.

The authors of the present study are aware of the limitations adopted at the construction stage of the test procedure. This included the choice of a narrow group of respondents and their number and the choice of only one test method. This of course affected the lack of possibility of major generalisations. The research was limited to the possibility of creating relationships with robots. In the future research, the authors plan to include the remaining paradigms of Industry 4.0 and to test a much higher number of students, including international students.

Nevertheless, the qualitative research we conducted, firstly, is a voice in the discussion on the future of the entrepreneurship concept in the context of the progressing Fourth Industrial Revolution, filling the research gap in the analysis of its impact on the possibilities of creating social capital and trust, especially in relation to young people entering the volatile labour market.

Secondly, the new knowledge and conclusions resulting from this, as well as a critical evaluation of the research conducted, allowed us to outline the directions of further scientific work being conducted by the authors, which envisages the development of a questionnaire, expanding the group of research participants to include academic teachers, and extending the scope of research to an international dimension.

Thirdly, the information we obtained can be used further in shaping programmes for the education of economists at a university level (perhaps even in secondary schools) in the field of entrepreneurship.

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