Section 6. Electrical engineering

https://doi.org/10.29013/ESR-22-11.12-28-35

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ANALYSIS OF THE EFFECTS OF ARTIFICIAL INTELLIGENCE ON LABOR, EMPLOYMENT AND INCOME DISTRIBUTION

Abstract. The paper's aim is to explain the impact of Artificial Intelligence (AI) to the current and future of work environment. The impact of Artificial intelligence on our work is the topic which became so important to discuss last years and creates confusion in people's minds in the case of its future. Whether many people argue its development will have more negative sides, paper supports the idea of creating more jobs with improvement of technology, but at the same time widening income equality in the world. The study shows that people believe in the importance of artificial intelligence and its growth in the workplace, but at the same time being optimistic in case of creating new jobs, increasing or having stable salary. Moreover, the survey also supports the idea that in future mainly less- and middle-skills needed jobs will be replaced more by artificial intelligence.

Keywords: artificial intelligence, job, income, future. *JEL Classification:* J24, J69, O3.

Introduction

Artificial intelligence has an impact in all parts of business starting from finance to IT, and even management. When AI impact growth, it creates some changes in business which are negative for some employees and positive for business, such as replacing less and middle-skill workers with computers. Workers of all educational levels are badly influenced by robots, although those without a college degree are negatively affected far more than someone with a college diploma or above (Brown [7]). From another point of view, from the survey at the end of article 1/3 people are already think that they are ready to replace employees by AI, if AI can do the same work as people. In comparison to commuter zones without exposure to robots, between 1990 and 2007, the rise in robots (about one per thousand workers) decreased a zone's average employment-to-population ratio by 0.39 percentage points and average salaries by 0.77 percent. According to this, a region loses around six workers for every robot that is added (Brown [7]).

Research methodology

The qualitative data were collected from referenced websites and related articles were used to express common opinions about AI and employment. Additionally, exploratory analyses were used to explain the survey, which was done among 184 people. Online survey was done to understand current opinions about AI and its impacts, thoughts about the future and its effects on jobs. The survey had questions about AI impact on salaries, replacement of workers, effects on new jobs and how likely are participants to replace employee by AI if it is

possible. The survey was done among people who are employed, and the survey was one fully anonymously with open shared age, gender information. To express thought better, survey consisted mainly multiple choice with possibility to add additional thoughts and linear-scale question types. Understanding Artificial Intelligence.

Artificial intelligence became the main topic of our world, especially during the last 10 years. When people who are working in IT, then people who are optimistic regarding the future of the world are enjoying this topic, at the same time there are some people who are focusing mainly on the negative sides as well. However, simple computers do whatever is coded in them, whether the main aspect which makes AI unique is the ability to learn (Stahl [15]). Artificial intelligence is a topic that, in its most basic form, combines computer science and substantial datasets to facilitate problem-solving. Additionally, it includes the branches of artificial intelligence known as deep learning and machine learning, which are commonly addressed together.

How did we come to this day?

Everything started in the 1950 s with small steps, ideas about this field. The first practical results were seen in 1997 when IBM's AI powered machine Deep Blue beat Garry Kasparov. Then, in March 2016commands from people to learning how to play by itself. Today AI is used nearly in every aspect of our life including finance, health care, transport, education and so on. It is a fact that sometimes people are interacting, talking, or connecting with AI even without knowing that they are interacting with AI. For example, the most known face detection square in mobile phone cameras is powered by AI and people do not know that it is AI. Then, AI powered chatbots, which became so popular during the last years, are talking with people and saving hundreds of thousands of dollars for businesses (Reeves [17]) As an example of it can be noted, self-driving cars which are nearly fully automated. Actually, it is clear that fear comes from having less information about the topic. It is a fact that when people see in social media or in Google advertisements about their interests (latest searches), they are surprised and never complain that they saw ads according to their interest which has been powered by AI.

AI and labour

It is clear the impact of technology in almost all areas of business, from production to HR. So, this is the reality that IT impacts all of them but making some of them less human depended. According to data, during the previous four years, the usage of AI in several business areas has increased by 270%. (Stahl [15]).

In their research, Frey & Osborne concluded that 47 percent of employment in the US is at danger of automation in the next ten to twenty years, but 33 percent of jobs have a minimal risk of automation. (Aghion, Antonin, & Bunel, 2019) According to Oxford University's categorization research, up to 35% of all workers in the UK and 47% of all jobs in the US are at danger of being computerized during the next 20 years. Today, it seems that today AI is not taking our work from us fully, in reverse it is supporting people and making their work and lives easier.

The following 2 charts are showing annual installations of industrial robots:

It should be underlined that low-wage nations like China, India, and Bangladesh continue to profit from their excess of unskilled laborers while Western businesses continue to outsource their manufacturing to these nations. Jobs requiring low or medium qualifications will eventually disappear. When the cost of human work is 15% greater than the cost of robotic labor, replacing human manual work with robots makes financial sense in nations with low labour costs. Construction of plants where robots would replace 90% of the human workforce has already begun in China (Javelosa [9]). Additionally, during Covid-19 all these processes gained importance and speed, replacing human labour with AI.

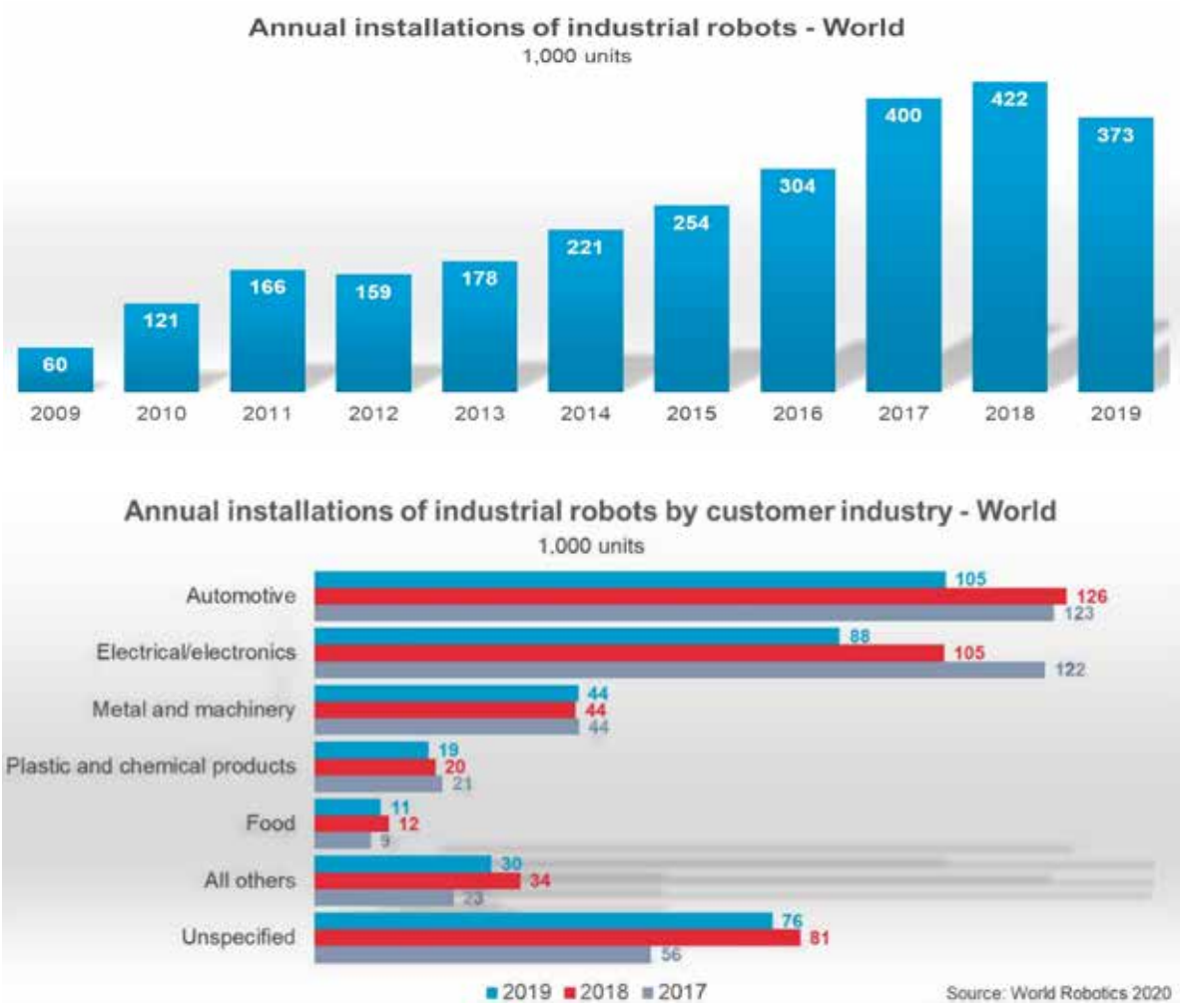

Figure 1 & 2

Source: www.ifr.org

AI and income distribution

By delivering services and producing goods more effectively than ever before, artificial intelligence can create significant value. But a lot of people worry that this will result in an even wider gap between the rich and the rest of the world. It has always been arguable that AI is creating more new jobs or causing unemployment. Generally, the labour force can be divided into 3 groups: low skilled works, middle skilled works and high skilled works.

Over the past few decades, the nature of work has changed. The difference between workers who have access to higher education, leadership development opportunities, and work experience – and those who do not – is expanding due to the new digital divide. Middle-skill occupations are disappearing in favour of entry-level, low-skill work and high-level employment that demands higher skill levels as the labour market has become more split. The Covid-19 crisis has probably sped up the procedure (Cremer & Kasparov [3]). Generally, the number of low skilled works is increasing, the number of middle skilled works is decreasing and the number of high skilled works is increasing.

In this graph it is clearly described the rise of low skilled share in employment in all types of countries, huge increase in demand for high skilled and huge decrease in demand for middle skilled workers. This graph is also another proof how AI is impacting employment and income equality. This

is explained with routine tasks and non-routine manual works are primarily carried out by low-educated individuals, whereas routine cognitive works are primarily carried out by middle-educated and non-routine works are carried by high-educated workers.

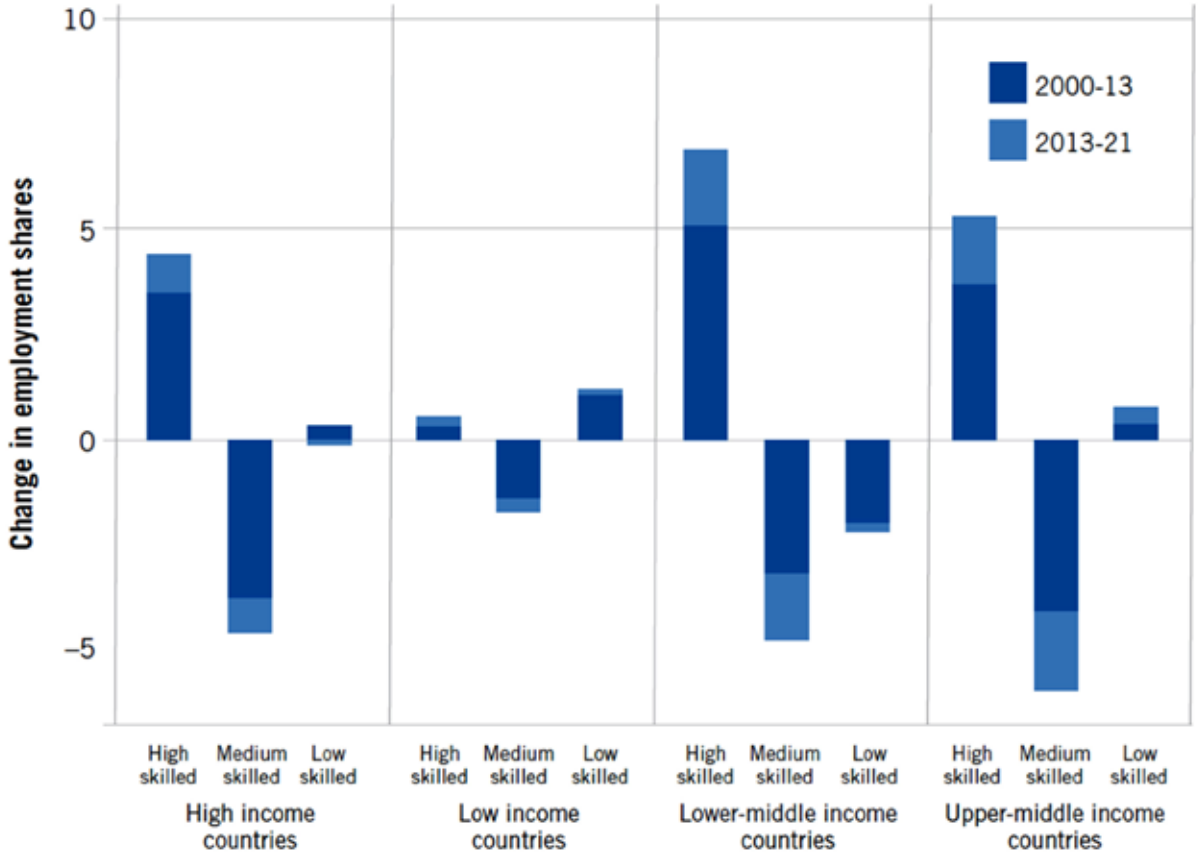

Figure 3. Change in employment shares
Source: International Labour Organization

AI and employment

By 2030, scientists estimate that using artificial intelligence (AI) more widely would boost the world economy by up to $15.7 trillion. Intelligent technologies are already replacing people in manufacturing, service delivery, recruiting, and the financial sector, which forces human workers into lower-paying positions or leaves them unemployed (Cremer & Kasparov [3]). The Covid-19 has expedited technological development and the digitization of many everyday jobs, from robots that deliver parcels to contactless cashiers. Many people are worried that artificial intelligence (AI) could significantly increase automation and eliminate employment in the ensuing decades. In many other occupations, the technology will alter the nature of work by enabling people to concentrate on higher-value, higher-touch activities that frequently need human contacts. Individuals and businesses who will have more opportunity to be innovative, strategic, and entrepreneurial will gain from these newly improved positions

Survey about AI and employment

In order to understand the current (2022 year) approach of people towards Artificial intelligence and employment, salaries, there was a research done among 184 people. One of the question of survey is Do you think that the importance of AI in the workplace is growing?

Participants answered the following way: 153 (83%) Yes, 6 (3%) No, 25 (14%) Maybe

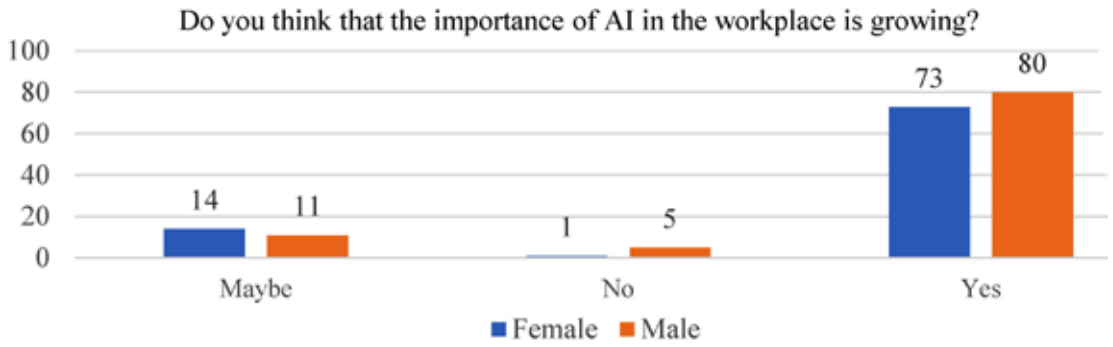

Figure 4.

The following question is Are you afraid of impacts of AI on your jobs? Answers were: 15 (8%) Yes, 115 (62%) No, 54 (30%) Maybe

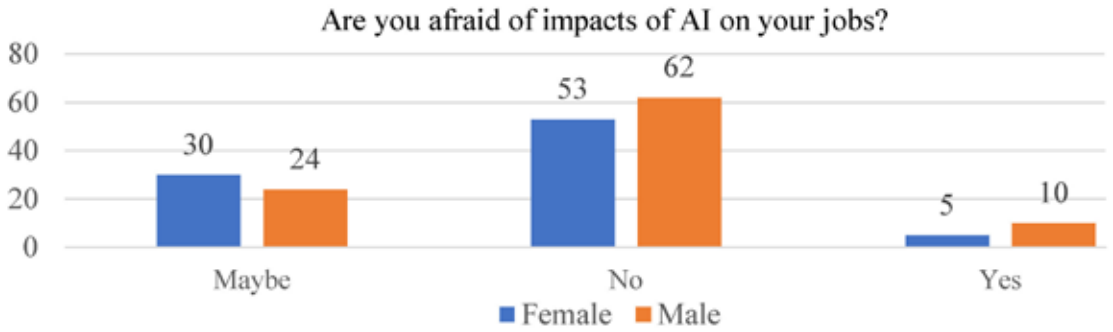

Figure 5.

The following question is What do you think, how likely is your current job will be replaced by Artificial Intelligence?

Participants were asked to evaluate from 1 to 10 whether 1 is less likely and 10 is most likely. Mean for answers is 5.2. Answers 8, 9, 10 were given mainly by people who are working in IT / Computer Science / Network (13 out of 38, 34%) and Finance (12 out of 38, 31%) and remaining 35% percent from other industries.

The following question is If you are director of one company, if AI can replace some of your workers fully, will you approve to replace them by AI (computers) or not?

From the answers it is clear that 30% (55 out of 184) of participants said Yes, 25% (46 out of 184) said No and and 45% (83 out of 184) are not sure or said dependson situation (taking into account cost, efficiency and the possibility of replacement).

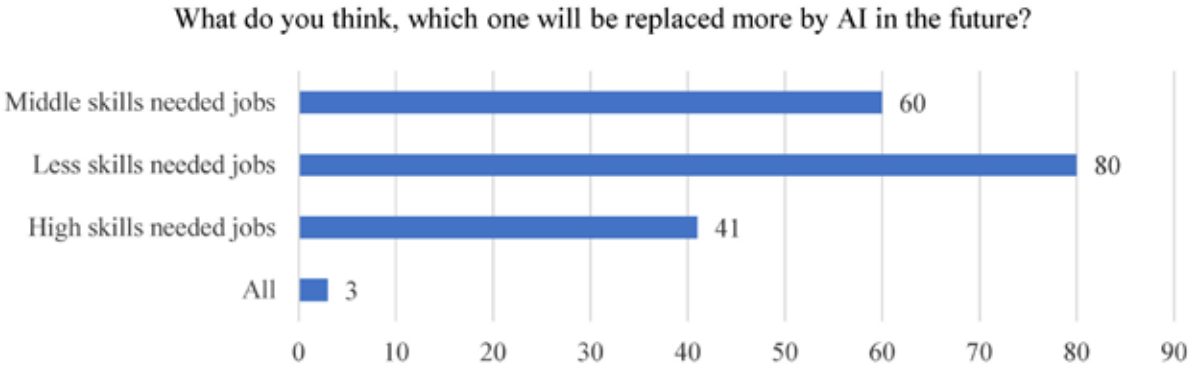

Figure 6.

The following question is Do you think, in future Artificial Intelligence will create many new jobs or not? 68% (126 out of 184) answered will create, 28% (51 out of 184) answered will not create and remaining 4% (7 out of 184) are not sure.

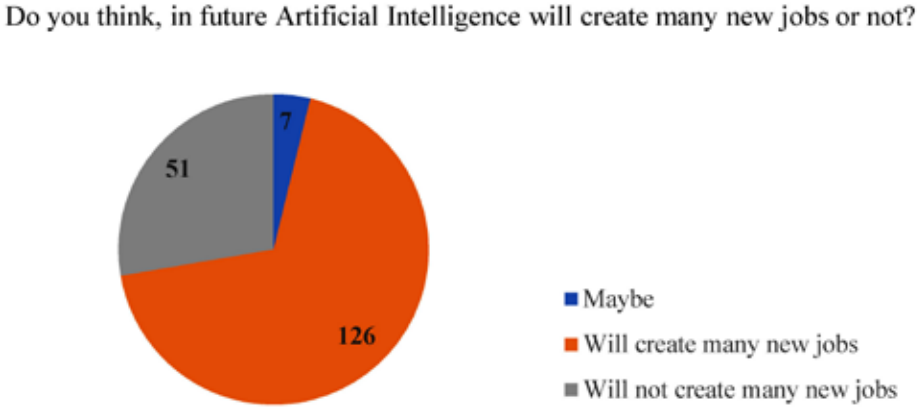

Figure 7.

The last 2 questions are two of the most important ones in the survey which are focused on AI replacement of works and the future of salaries.

The following question is What do you think, which one will be replaced more by AI in the future? 43% (80 our of 184) responded less skills needed, 32% (60 out of 184) middle skills needed jobs, 22% (41 out of 184) high skills neeed jobs and 3% (4 out of 184) all.

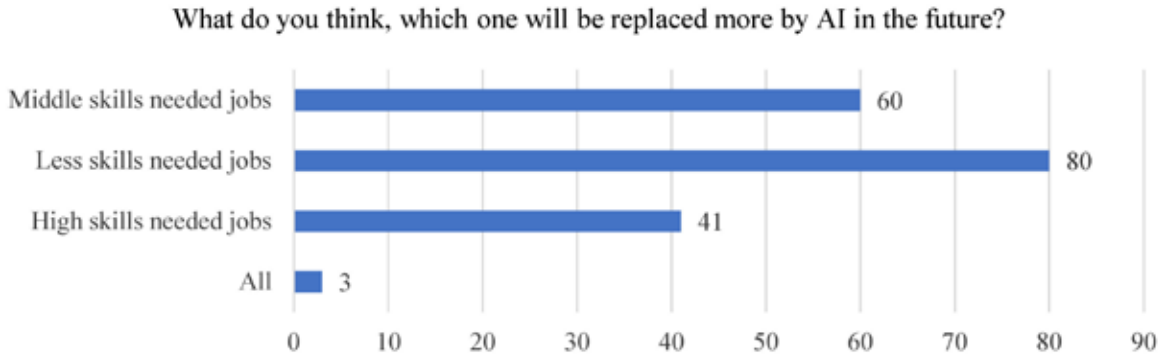

Figure 8.

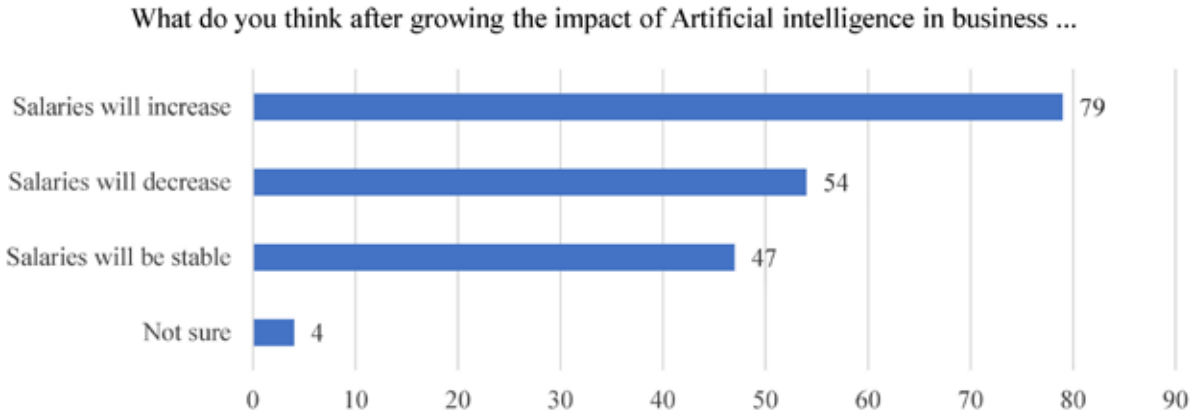

Figure 9.

The following question of the survey is What do you think after growing the impact of Artificial intelligence in business, salaries will (increase, stay stable or decrease)? Responses for the this question were following: 79 (43%) increase, 54 (28%) decrease, 47 (25%) stable, 4 (6%) Not sure.

The last question about AI is very simple, Do you think Artificial Intelligence is FUTURE and we should focus on it more? Respondents answered the following way: 130 (70%) Yes, 46 (25%) No, 8 (5%) Maybe.

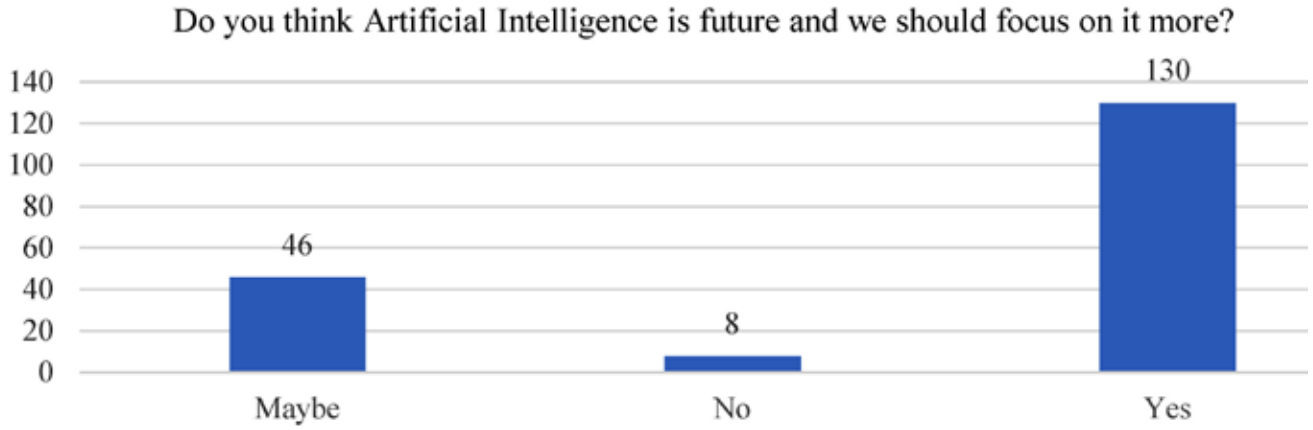

Figure 10.

From the survey there are some conclusions can be made. First of all, people do believe that the importance of AI is growing in workplace and from survey it is clear that that is huge proportion of people (83%). At the same time 30% of people are not sure that they are afraid or not aftaid of impact of AI on their jobs whether twice more people think that they are not afraid of its impact and its nearly same number in male and female participants. Moreover, on average people give between 3 and 7 to the question how likely is their work can be replaced by AI (1-less likely, 10-most likely), and on average it is 5.2. Then, nearly half of people (45%) are not sure that they can replace people with AI, if computers can do work as people and 1/3 answered as Yes for this replacement. Aditionally, more than 2/3 people (68%) answered as AI will create many jobs in future and a bit less than 1/3 participants (28%) think that it will not. Moreover, 75% of respondents think that less- and middle-skill needed jobs will be replaced in future by AI. At the same time 43% think that salaries will increase and 28% decrease, 25% stable.

Conclusion

First of all, it is fact that from MIT studies the employment-to-population ratio decreases by 0.2 percentage points and salaries fall by 0.42 percent for every robot added for every 1.000 workers in the U.S., according to the study. To date, this has resulted in the loss of around 400.000 jobs. (MIT) This study's conclusion can be understood this way: today people believe that AI is the future, the role of AI in all spheres increase and it has huge impact on businesses. When general studies till know proves that the more AI is envolved in business, the more income unequality occurs, the more people become unemployed, but survey shows that now people do not think about such negatively about AI. Respondets think the more AI is involve in business, it will increase salaries, will create more jobs. Finally, they do not think mainly if they can replace or not employees by AI fully if they were boss and they think that mainly less- and middle-skilled employees will be replace by AI. This article is recommended for researches who work on topics about AI and its impacts to employment, labor and income equality.

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