COURSEWORK 2 – CSI_4_PPR

The transformative influence of AI on Job automation, Education, and Training Introduction

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This paper debates the future of education, work, and training in the era of automation and in particular the proliferation of Artificial Intelligence and its impact on the world of work. In general, there is a debate about whether the future of work, education, and automation with AI is on the rise, which would potentially, change the way we live our lives for the better or worse. According to (Badet, 2021), around 15% of the global workforce, (400 million workers) is likely to create unemployment between 2016-2030. After analysing there will be a point in time, when automation is likely going to affect less-educated workers i.e. workers with little to no qualifications, and low-level jobs (low-paying jobs) resulting in high unemployment of labour, thus reducing the demand for labour in the market.

If this were to happen, governments would need to find a solution to retrain the labour force by investing in education and training courses – to make workers more qualified for jobs with higher demand.

Main body

Introduction to AI technologies contributing to job automation across different industries

In the 21st century, AI technologies have been increasingly being used to automate repetitive tasks and processes which is normally done by humans in industries such as manufacturing. Since AI, is commonly used by many businesses it boosts productivity by ensuring tasks are automated efficiently tasks such as data analysis, leading to an improvement in the efficiency of services.

The healthcare industry can use AI for a better and more efficient diagnosis than human doctors can. This could potentially save millions of lives from a disease like Cancer as it can't be diagnosed quickly since multiple tests need to take place to find out what type of cancer/illness a patient is experiencing. AI can also be used to find cures or vaccinations for incurable diseases like cancer (Zane, 2023). Thanks to AI and advanced technologies, the vaccination for COVID-19 was found by Pfizer which has boosted people's immune systems. The textile industry, requires the production of fibre, relevant fabric from yarn (e.g. by weaving or knitting) etc. Each of these tasks which have been stated is performed by both machines and human labour (Acemoglu and Restrepo, 2018). It is clear based on this research on automation in the production industry, working alongside AI technologies (automated machines) increases the productivity of workers and the output being produced per worker is quicker which would reduce the cost of production and increase efficiencies such as technical economies of scale whereby as output rises the cost for producing those goods and services decrease.
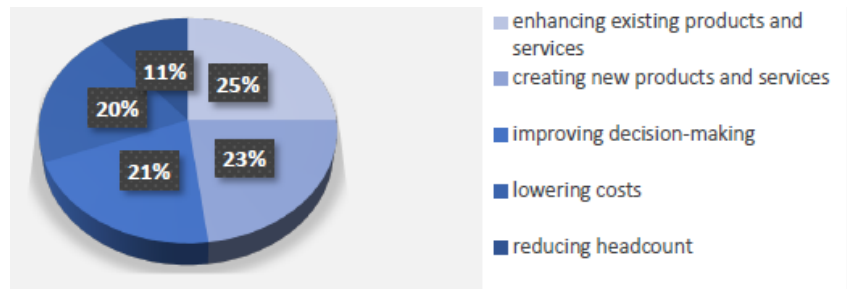
Figure 1 – Objectives of AI applications (Zane, 2023)

Using AI to enhance existing products and services, allows entrepreneurs to innovate and improve the goods and services provided to their customers. Allowing them to stay in the competition and with the help of AI predict what the competition will be like in the future. AI will also allow entrepreneurs with decision-making, especially if it will likely change how their business operates, changes, etc. In other words, it allows professionals like managers and directors with the support of AI to make decisions which would benefit their company overall. For instance, Kiva used by Amazon allows its warehouse orders to be four times the speed compared to a regular human warehouse worker – improving warehouse efficiency (Poba-Nzaou et al., 2021). As automation is utilised, consumers can benefit due to lower production costs being achieved (cheaper capital being used), resulting in those lower costs being passed onto consumers via lower prices. Therefore, leading to a rise in consumer demand (Wright and Schultz, 2018). On the other hand, it can be argued because of automation taking over low-skilled jobs, will lead to lower demand for goods and services since there will be a decrease in wages, and consumers will have less disposable income to spend, thus leading to lower economic growth and consumer demand. If this continues to occur throughout the labour force this is likely to increase recessionary pressures, whereby demand in an economy will be low as consumers would be more obliged to save their income rather than spend, since consumer confidence will be reduced.

Eventually, automation is going to replace workers who work in low-skilled jobs. According to (Colback, 2020), 75 million jobs will be displaced by AI and 133 million jobs could be created to help maintain and control the AI. Similarly, (Badet, 2021) says 555 million or 890 million jobs will be created by the year 2030. By analysing these two different statistics, automation will have some positive impacts on the job industry, in the sense more jobs will be created than job losses. One of the requirements is a high level of education/qualification is required to obtain these highly qualified (high-paying) jobs to build, launch, and maintain these artificial intelligence systems.

Possible solutions towards rising issues for employees

As automation rises in the working world, to reduce the impact of the displacement effect, companies, employers, and governments need to come up with solutions to help those people's jobs who are at risk of being replaced by automation (AI). A policy to help the workforce, is by investing in the workforce to retrain displaced workers, who are working in companies, i.e. on lower salaries, will need to be retrained to work with advanced levels of technologies. Putting this policy into place ensures employees are not left behind and they move forward in their working careers. For example, AT&T is a telecommunications service provider based in London, they've re-educated 100,000 of their employees with the help of online university courses (Wright and Schultz, 2018). For a company like AT&T, it is vital to reskill their employees since it would reduce hiring costs for highly qualified workers as they would need to be paid more for the work they are contributing to the company. As these AI technologies advance by the day, there will be an increase in the demand for individuals who are qualified, understand and develop these autonomous systems.

Therefore, Governments should encourage companies like AT&T to invest in education and training courses, perhaps through subsidies, companies will be more encouraged to invest and retrain their workforce to be better suited for working with AI. Therefore, these incentives may also increase the rate at which the workforce can adapt to its surroundings (as automation increases).

However, if governments continue to give out subsidies to companies this may lead to them becoming more dependent on the government since they wouldn't be spending much on training courses. It can also put a burden on the government finances as they may have to take on more debt (opportunity cost) resulting in a deterioration in the government finances.

AI technologies in education

One of the impacts of AI on education is the ability to help those students who have a hard time learning new concepts or need another way of being taught different concepts i.e. special needs children. According to (Gocen and Aydemir, 2020), the utilization of AI in education will allow students to learn better due to individual and effective learning experiences being created for those who prefer to be self-taught rather than being taught by a human teacher.

Moreover, using AI in the classroom is likely going to allow teachers to change the ways they deliver their classes, assignments, and in-class tests. This would reduce the decision-making teachers would need to make for each student's study plan and learning in the classroom, as AI would be able to give suggestions regarding teachers' day-to-day tasks. It allows them to save more time and being able to prioritize other tasks.

TABLE 1. Techniques for scenarios of AI education.

Scenarios of AI education	AI-related techniques
Assessment of students and schools	Adaptive learning method and personalized learning approach, academic analytics
Grading and evaluation of paper and exams	Image recognition, computer-vision, prediction system
Personalized intelligent teaching	Data mining or Bayesin knowledge interference, intelligent teaching systems, learning analytics
Smart school	Face recognition, speech recognition, virtual labs, A/R, V/R, hearing and sensing technologies
Online and mobile remote education	Edge computing, virtual personalized assistants, real-time analysis

Figure 2 – Scenarios for AI education taken from (Chen, Chen and Lin, 2020)

Students can benefit from adaptive learning with a personalised learning approach because it can increase student engagement and learning becomes more proactive for students. Thus, it can increase their motivation to learn new concepts. Teachers, being able to use AI to mark exam papers and assignments, would save time and reduce stress for teachers (Chen, Chen and Lin, 2020). The feedback which is generated by AI will help students where they're lacking in knowledge, thus allowing them to improve themselves academically.

Teachers can help students learn new concepts and find out which mistakes are common among students, allowing them to assist them further with guidance on how to overcome these mistakes – with the assistance of AI.

Similarly, (Gocen and Aydemir (2020)) also agree AI will have the ability to help individual students, therefore allowing them to learn at their own pace, as this is beneficial for their academic learning.

An AI tool which specialised in maths and science tutoring/teaching, AutoTutor, supports students' learning in subject areas such as physics, computer literacy, and can teach students how to think critically (Hwang et al., 2020). Thinking critically is a crucial characteristic when it comes to working in the real world, as this can boost confidence and adaptability.

ChatGPT in the Education environment

An AI tool which is widely used, ChatGPT, has numerous use cases. It's able to generate code, debug code, and summarise paragraphs (Adeshola and Adepoju, 2023), thus, useful for students who are studying majors such as computer science as they can seek guidance on how to do a particular coding task. It can provide feedback, allowing students to get help on the questions they're struggling with, meaning that they can learn more effectively by engaging with the content they're studying (Zane, 2023).

In a way, it is also able to be a somewhat personal teacher for them, which would provide students with their personalised virtual tutor, allowing them to learn at their own pace. For teachers, it can be used to automate tasks such as creating questions for multiple choice question tests for a particular topic or grading students' assignments. Allowing teachers to focus on different tasks due to the use of ChatGPT.

How trustworthy is ChatGPT for students and teachers?

However, the extent to which ChatGPT can be used full-time in Education would depend on multiple factors. One of the factors is, that ChatGPT is classified as an AI assistant for students, some students would argue these systems are emotionless and are less engaging compared to if they had a physical teacher (Adeshola and Adepoju, 2023). Suggesting that students would prefer having a physical teacher to teach them concepts, as teachers can understand (emotionally) and help those students where necessary. Since ChatGPT is limited in what it can provide to students, as it is not able to access the internet. If students would like for ChatGPT to access information and data in real time they would have to purchase ChatGPT Plus in that case.

Another case could be students may lack the technology and sufficient internet which is a requirement when it comes to accessing AI systems, like ChatGPT in this case. This can become a barrier, as those students who have access to the internet and technology (privileged students) may have an unfair advantage over those students who come from low-income families and are unable to afford necessities such as technology.

Furthermore, (Loos, Gröpler and Goudeau, 2023) also agree that ChatGPT doesn't hold any emotions, which makes it difficult to understand and respond to problems, in the way humans think. By reading these different views, regarding ChatGPT it is clear based on research done from these journals, that ChatGPT cannot understand and solve problems in a human would. This would make it unethical to use ChatGPT as a full-time tutor for students as its training data which is used to train the AI model could contain biased information, which can be seen through the responses to the user's different questions. Another threat which ChatGPT has is increased concern regarding ethical and regulatory issues, for instance, concerns such as ensuring that data is private and secure and whether factors such as bias will have to be dealt with.

Ways in which ChatGPT can be made more reliable for the education sector

Ways in which these issues can be dealt with, ensuring data is stored in a safe and secure place, by enforcing privacy regulations such as end-to-end encryption. Which is likely to build the trust of the user (students) by using AI Chatbots, like ChatGPT.

Also, ensure that ChatGPT regularly updates, so it can generate the latest information regarding a question or topic area, which will make certain no information is outdated, which is likely to increase the usability of ChatGPT in education. Which can increase the use of ChatGPT in education which students benefit from.

Conclusion

To conclude, the transformative influence of AI on Job automation, Education and Training, is shaping the workforce, which could lead to job displacement, the creation of new jobs being created. Importantly re-skill the current workforce, they can adapt to the impact of AI disrupting the labour market. Proactive measures like retraining programmes for unemployed workers are crucial for them to adapt to changes AI automation makes for them.

There is potential for using AI in education since it allows students to have their own personalised experience and improves teachers' efficiency in carrying out their repetitive tasks. This raises ethical issues regarding whether AI will keep students' and teachers' data private/secure, which will depend on whether they will choose to use AI for educational purposes.

Therefore, it is important, for research to still take place since these challenges and benefits can be better understood in the way AI will change the future of work and education.

Reflection

Description:

For CW1, my initial thoughts were being expressed through a mixture of excitement and apprehension since I was going to be collaborating with other people, whilst completing my work on the presentation. My experience of coordinating different tasks has allowed me to reduce the burden of work that I had to complete for this assignment. Another thing which I experienced during CW1, is managing schedules to ensure that our team knew where we were at with the work, and what had to be done to make further progress. I felt satisfied since there was shared responsibility between my team and me.

For CW2, it was about a sense of freedom and control over how much work I could contribute to my assignment. Meaning that I as an individual, didn't have to rely on anyone to complete the part of the work for me. A challenge which I had faced, was having to manage the workload independently since I was dependent on completing the work on my own. At times, it was difficult for me to manage my time to do some coursework since I was completing it in the holidays resulting in other activities outside of coursework. Also, since it was Ramadan, not being able to eat or drink from sunrise to sunset, can be exhausting since I needed to complete three tasks for this assignment, as well as focus on other assignments outside this module – which made it hard for me to focus on my work at times.

Feelings:

In CW1, I believe our team performed well. We were able to divide tasks as well as communicate our ideas effectively via MS Teams for holding meetings and having a WhatsApp group chat to ask questions and schedule times to meet regarding the assignment. A challenge during this assignment was that relying on one another to complete one task, rather than helping to complete one task as a whole group, slowed down our progress. Another challenge I experienced was that, managing my schedule throughout the day to meet with my team regarding the assignment.

Whereas, for CW2, I believe I was able to sort out and carry out the tasks which were required to ensure that there was quality in my work. For instance, every day I would set out a to-do list for what tasks I had to get done for that day. This allowed me to do a bit of work every day while trying to maintain quality over quantity. However, there were times when I felt like I hadn't done enough work for one day and felt like I had more to get on with. This led to me feeling overwhelmed because of the workload as well as doubting myself whether I will be able to complete my work before the deadline.

Evaluation:

After reflecting and thinking about the challenges I had faced in both assignments. In CW2, despite enjoying working by myself, it was hard for me to manage my workload on my own without external support from my tutor (since I was completing this assignment during the easter holidays, teachers would rarely look at their emails), which at times made it difficult for me to do my work as I wasn't sure if I was completing the assignment in the correct specification. I.e. in the way, Francis has asked to complete the assignment.

In CW1, I thoroughly enjoyed working with different people from different backgrounds and different perspectives to do a task. On the other hand, there were times when I struggled with the workload which had to be completed for the presentation, and at times became so overwhelmed by the workload that I worked on it until midnight just to make sure that I not slowing the work down.

Analysis:

Looking back on these completed assignments, I have learnt a lot in this semester such as working with a team to complete certain tasks, presentation skills, and working individually to complete an assignment. Personally, what I think I could've done better for CW1, is asking, and clarifying any questions I had regarding the assignment and the tasks which were assigned to me. If I was especially struggling to find information or complete a task for the assignment, I could have asked my teammates and tutor for guidance on how to overcome this.

For CW2, ensuring that I manage my time effectively, ensuring I prioritize the tasks that are worth more marks, in this case, the self-directed essay writing task – since it was worth 60% of CW2. Also, proofread my work a couple of times to ensure that it is done to the best of my ability before the day of submission.

Conclusion/Action Plan:

Moving forward, I will apply these lessons learnt in future individual and group assignments. One of them is, improving communication amongst teammates, and being able to manage my time for completing assignments/tasks given to me. I don't take a lot of pressure when it comes to finishing work if I already know that I am making progress. I would also like to set goals which allow me to improve my personal development, based on feedback from teachers, and peers and self-reflecting on what went well and what I will do better for the next coming assignments. Which makes sure that I am constantly willing to make changes and add improvements to the way I approach and carry out completing an assignment. We are humans and we always learn new things every day, and if I am willing to improve and make changes to the way I approach my assignments, I should be able to make excellent progress throughout my time studying computer science, as well as enjoy my life at LSBU.

Reference Page

Adeshola, I. and Adepoju, A.P. (2023). The opportunities and challenges of ChatGPT in education. *Interactive Learning Environments*, pp.1–14. doi:https://doi.org/10.1080/10494820.2023.2253858 [Accessed 22 Mar. 2024].

Badet, J. (2021). AI, Automation and New Jobs. *Open Journal of Business and Management*, 09(05), pp.2452–2463. doi:https://doi.org/10.4236/ojbm.2021.95132 [Accessed 15 Mar. 2024].

Chen, L., Chen, P. and Lin, Z. (2020). Artificial Intelligence in Education: A Review. *IEEE Access*, 8, pp.75264–75278. doi:https://doi.org/10.1109/access.2020.2988510 [Accessed 20 Mar. 2024].

Colback, L. (2020). The Impact of AI on Business and Society. *The Financial Times*. [online] 16 Oct. Available at: https://www.ft.com/content/e082b01d-fbd6-4ea5-a0d2-05bc5ad7176c [Accessed 15 Mar. 2024].

Gocen, A. and Aydemir, F. (2020). Artificial Intelligence in Education and Schools. *Research on Education and Media*, 12(1), pp.13–21. doi:https://doi.org/10.2478/rem-2020-0003 [Accessed 20 Mar. 2024].

Hwang, G.-J., Xie, H., Wah, B.W. and Gašević, D. (2020). Vision, challenges, roles and research issues of Artificial Intelligence in Education. *Computers and Education: Artificial Intelligence*, 1, p.100001. doi:https://doi.org/10.1016/j.caeai.2020.100001 [Accessed 27 Mar. 2024].

Loos, E., Gröpler, J. and Goudeau, M.-L.S. (2023). Using ChatGPT in Education: Human Reflection on ChatGPT's Self-Reflection. *Societies*, 13(8), p.196. doi:https://doi.org/10.3390/soc13080196 [Accessed 22 Mar. 2024].

Poba-Nzaou, P., Galani, M., Uwizeyemungu, S. and Ceric, A. (2021). The impacts of artificial intelligence (AI) on jobs: an industry perspective. *Strategic HR Review*, 20(2), pp.60–65. doi:https://doi.org/10.1108/shr-01-2021-0003 [Accessed 17 Mar. 2024].

Wright, S.A. and Schultz, A.E. (2018). The rising tide of artificial intelligence and business automation: Developing an ethical framework. *Business Horizons*, 61(6), pp.823–832. doi:https://doi.org/10.1016/j.bushor.2018.07.001 [Accessed 17 Mar. 2024].

Zane, M. (2023). *Artificial Intelligence and Job Security Challenges*, 3 [Accessed 28 Mar. 2024].