

Artificial Intelligence: student perceptions of its impact on jobs and work

The Fourth Industrial Revolution (4IR), with Artificial Intelligence (AI) at its heart, is changing the labour market on a colossal scale. Questioning the assumption that digital natives should transition comfortably to the automated workplace, a study was conducted in May 2019 into students' views of the impact of AI on the economy, skills and jobs. It found that these students viewed AI negatively: they felt threatened and disempowered by it, pushed into an automated future they did not want, and their most dearly-held values conflicted profoundly with the principles they perceived would govern machine-human interactions.

Research Context

When articulating 4IR, Klaus Schwab anticipated the disparity between “those who embrace change versus those who resist it” (Schwab 2016: 97). A possible 65% of children entering primary school today will work in jobs that don't yet exist (WEF cited in North 2019). More companies are investing in AI than in any other digital technology (McGrath 2019) because AI isn't just a new technology, it is “*the next general-purpose technology (GPT)*” (Trajtenberg 2018: 1), the platform on which all other technologies and applications will run.

Imminent accelerators are 5G and the Internet of Things (IoT). Ericsson expect 5G to have 2.6 billion subscriptions covering up to 65% of the world's population by 2025 (2019). IoT will extend connectivity to a wider range of devices, but this sits uncomfortably alongside digital poverty figures revealed by the Covid-19 lockdown that few UK state schools have an online platform (private schools 60%, state schools in affluent areas 37%, state schools in deprived areas 23%)(Cullinane and Montacute 2020).

The UK aims to be ranked third, behind China and the US, in the global AI race (Iqbal 2018). The UK government's Industrial Strategy (GB Dept for BEIS 2017) lists AI and the Data Economy as the first of four Grand Challenges, and an All-Party Parliamentary Group on AI (APPG AI) was created in 2017, one of whose Four Pillars is Citizen Participation. This study explores the views of three groups of younger people, to hear their voices as discussions begin and policies form about AI.

Literature Review

As in every era of technological innovation, the private sector is at the cutting edge in 4IR. According to Cookson (2019), the first AI-related patents were filed in the 1950s, reaching 18,995 worldwide in 2013, almost tripling to 55,660 in 2018, while the ratio of scientific publications on AI to AI patents fell from 8:1 in 2010 to 3:1 in 2016, showing a shift from theoretical research to industrial application. PwC predicts that UK GDP may approach 14% higher in 2030 as a result of AI (Rao and Verweij 2017), with 55% of businesses planning more investment in new technologies and one third expecting radical disruption by 2021 (McGrath 2019).

Public opinion has been fed by media stories, emanating from innovators and commentators, where impact and corporate self-interest are a higher priority than truth, accuracy and ethics (Scott Brennen 2018). In 2018, at two careers guidance conferences, key speakers (Hooley 2018, Kemp 2018) spotlighted the theme of alarmist media coverage about AI. The ubiquity of AI in creative output, such as films, video games, fiction and non-fiction, has been evident for over 30 years, with conspicuously nihilistic treatments.

Balancing this, academic attempts to collate, rationalise and interpret have emerged, beginning with Frey and Osborne's shocking research in 2013 estimating that 47% of US employment is at risk because of computerisation, particularly impacting on low-paid, low-skilled jobs. By 2015, Ford concluded that AI has the capacity to re-invent the labour market totally, exemplified by the gig economy (Hook 2015) and zero-hours contracts (Chiripanhura 2019). Also in 2015, Susskind and Susskind judged that the professional labour market may be similarly at risk, as machines perform routine elements of professional work previously done by people. Hambly and Bomford (2018) anticipate growing social inequality and lack of opportunity for self-actualisation; Hooley's (2019) changing world of work narrative rethinks the categories of work and education, while Diane Coyle advocates a new agenda of "welfare economics", which factors in more qualitative measurements, such as time (Coyle 2019: 44m 57s).

There is now a public policy response, aiming to take control of AI-driven changes, especially in the fields of ethics and workforce skills. There are growing pleas for

regulation and distinct developments in this direction: the EU is working on a Framework for Trustworthy AI and the Information Commissioner's Office is considering an AI auditing framework (Gardner 2019). The impetus towards skills development is better understood and universally accepted. The People foundation of the government's Industrial Strategy white paper (GB Dept. for BEIS 2017: 11) announces three key policies: a technical education system; boosted learning in STEM skills; and a National Retraining Scheme to re-skill older workers and enable existing workers to adapt to new skills demands.

Analysis of the skills needed is offered by many commentators, among them the World Economic Forum (2018: 22), where analytical thinking and innovation top the list in 2018, having not even made the top ten in the 2016 report. A similar skills list is identified by Bakhshi et al (2017), who draw optimism from the scope for re-skilling. At the heart of the government's strategy for AI skills is versatility and the ability to learn (Iliadis 2018), with individuals understanding the skillset of the future and assessing what he/she may need (Easton and Djumalieva 2018). Kashefpakdel and Percy (2019) consider how careers education can support students in their quest for crucial labour market skills. The National Careers Strategy (DfE 2017) omits Artificial Intelligence and automation, although it does cover STEM engagement at length and acknowledges new technology and digital talent; the Education Technology Strategy (DfE 2019) also recognises the digitally enabled world and the duty to maximise the benefits of technology. This is all top-down, however; the voices of citizens have been absent.

Methodology

The study was conducted during May 2019 at City of Oxford (FE) College, amongst Access to HE students. The approach was non-selective, as they were invited to participate as tutor groups. Of six tutors approached, three agreed to participate. The students were not personally invited in order to preserve anonymity and privacy; in the event, the participants were those who happened to be in college on the day of the research. There were 26 participants, from Combined Sciences, Art & Design, and Nursing courses, estimated to be aged 19 to 35 years old, with an average of around 25.

The research was conducted with two focus groups (Combined Sciences and Art & Design students) and one group surveyed by questionnaire (Nursing students). One-to-one interviews were rejected to avoid the risk that talking about a potentially threatening topic might make students feel vulnerable. No prior knowledge about AI or automation was assumed and students were not asked to prepare beforehand. To avoid direct and inappropriate questioning, the interview design was structured around four themes: AI in relation to the economy; to jobs; to skills; and their own personal response, including how they felt the CG profession could help. For each theme, relevant material selected from recent sources plus two or three questions were presented as a starting point for discussion. Every attempt was made to present purely factual material in as balanced a way as possible, in order to avoid introducing bias. The interviews were then analysed thematically.

Key Findings

The study explored what AI means to these students; what their feelings about it are; how it might manifest in the workplace; its possible effect on their own careers; and how careers services can help. While direct questions probing these issues were considered unacceptably intrusive, the evidence from the interviews was nonetheless analysed in this light.

Economic progress was viewed with scepticism, even fatalism

The views expressed were overwhelmingly negative: of the words used to describe AI, 62% were negative, 24% were positive, 11% were neutral and 3% gave no response.

“It’s good in the sense that it’s boosting the economy, but at what expense?”

“(AI’s) will just take over, won’t it? They’re more efficient than people – people need maternity leave, sick leave, things like that.”

Machines will take jobs away from humans

This was a recurring theme, influenced by films, video games and media headlines.

“Will there be more unemployment as a result of it? Will people like workers lose their jobs in the process?”

“What if AI wiped out, like, a whole industry?”

AI is just another wave of technology that may also create new jobs

They could see that AI might simply be the next technological innovation which creates jobs that could not have existed before, although some might be of dubious quality.

“You have IT technicians - they weren’t a thing 40 years ago. It’s nothing we haven’t seen before; it’s just progress.”

“I think it’s just going to create jobs that aren’t real, like influencers on Instagram.”

A job is more than an occupation

They were quick to see that work is about more than salary; purpose, meaning, identity and self-actualisation really matter.

“As a nation, we’ll be strong economically, but what does that mean per person?”

“If you’ve got robots doing everything for you, what are you here for?”

AI will affect the skills needed

They agreed that skills training is key, and were well aware of the risks of technological unemployment.

“If people who aren’t tech-savvy apply for jobs...it might exclude a lot of people from the working environment.”

“(Learning soft skills) doesn’t fit our educational structure at all, we don’t learn any of those things, it’s only work experience for two weeks.”

The human factor

Their greatest concerns were over jobs where empathy is critical, which they saw as a uniquely human skill.

“You could click all the symptoms you have and then it will give you a diagnosis, but when I go to the doctor’s, I need that personal human interaction.”

AI comes with serious ethical and social issues

These moral dilemmas were a source of real anguish, from machines becoming actively dangerous to wreaking intolerable social change.

“Data breaches are possible and people will abuse the technology.”

“Will it just make the people at the top richer?”

Concrete knowledge about AI and the labour market

There is a big gap in knowledge about AI; reliable information is scarce and the automated labour market feels mysterious. Careers services have a key role to play. “As long as the infrastructure and support are there from Careers and industry, as long as they are able to equip people with the skills they need to move with the evolving workplace, I think people will be okay.”

Discussion

Any new GPT is, by its nature, radical and disruptive (Laino 2019). In its AI incarnation, it lays down particular challenges to the CG profession, and is prompting a radical response (Watts 1996), where social inclusion and mobility are under such threat from new economic structures that Hooley, Sultana and Thomsen (2018) identify social justice as the contemporary battleground in CG.

The interviewee responses in this study revealed a deep vein of resignation to the technology and its potential human consequences. Seen through the lens of Roberts' Opportunity Structure Theory (1968), they felt trapped by a narrow range of unappealing options, while the real opportunities would flow to those with social and economic advantages. The hysteria that robots will take our jobs, our purpose and our identity (Schwab 2016) had proved infectious, and had engendered a mindset towards automation that saw many disadvantages and few benefits. An approach using Hodkinson's (1997) Horizons for Action is badly needed. In an AI-enabled world, people will have jobs, learn skills, grow and express themselves, but few of us have, as yet, any idea how. The students' responses showed an instinctive tendency to see their entry into the automated labour market in terms of personality and fit with environment (Holland 1985), but where they could only see misfit and minimal chances of self-actualisation (Maslow 1943).

It may be that narrative approaches, such as Life-span, Life-space Theory (Super 1980) and Life Design and Storytelling (Savickas 2005), emphasising personal interpretation, will enable people to accommodate the coming changes and see the alienation caused by automation not as personal exclusion but as part of a bigger pattern that affects almost everyone. In the face of radical and disruptive change, customers' ability to confront change and achieve transition will be critical, using

models such as Schlossberg's Career Development Transition Model (1995) and the Wheel of Change (Prochaska and DiClemente 1994).

If one imagined the collective evidence from this study presented as one individual in a CG interview, one could apply MDOTS (based on DOTS, Law and Watts 1977) to enumerate the CG actions needed. The negative mindset is a high priority, as it is driven by antipathy towards AI and desire to reveal its faults; attempts to encourage engagement with AI could struggle with someone who wants to see it fail. In the context of such negativity, decision-making will feel pointless, and, instead, a person may choose to defer making career decisions involving AI until it is forced on them, hardly a situation where self-efficacy (Lent, Brown and Hackett 1994) can shine. The area which offers true scope for change is opportunity awareness: the level of accurate knowledge about the automated workplace is very limited, yet a small amount of good information from a reliable source can help enormously. If anything can enable a person see what jobs exist, where they could fit in, how they might thrive, it is better knowledge of the opportunities. The issue of transitional skills is well recognised and provision is growing, although it remains the task for every individual to assess their own skills and identify and address their gaps. Self-awareness might offer a good transition point: helping someone understand their Career Anchors (Schein 2016) could build confidence and resilience, and change mindset.

Implications for professional practice

- AI needs to be de-mystified: we should be clearer about what AI is, what it does, and how. By defining and demonstrating it, people can be informed by facts, not myth, and the mistrust and fatalism seen in this study can be replaced by empowerment, confidence and enthusiasm.
- Excellent LMI about AI-enhanced jobs: we need to explain how AI enhances a job. What does that job entail? How is it different from the same job without AI? How do you learn to do it? What does it feel like? We need to help students see themselves working in it.

- Strong links with employers: in certain sectors, many jobs already incorporate robotics and AI; those employers and employees could very usefully share their knowledge, putting a human face on the tech and making it real. Digital T levels commence delivery from September 2020, and we need to develop AI-encounter opportunities in all forms of work-based learning.
- Experiential learning: because AI cannot be seen, heard or touched, the best way to understand it is to learn by doing. The CDI already has a strategy for developing digital platforms and tools; this could be extended to automated platforms and tools in its next iteration, and learning needs arising from digital poverty should be addressed.
- Openness to change: much of these students' antipathy towards AI was born of existential fear and visceral reluctance to change. They perceived that the world they had grown up in was changing, and were anxious about separating from their younger selves in a simpler world. CG work already entails a high level of support when transitioning: in an AI context, it gains new urgency.
- Ethics: the message from these students was simple. If they aren't happy about the ethics of AI, they can't be happy about any of it. This resistant mindset could prevent other good work from being effective. As CG practitioners, we should routinely review our own views of AI, to avoid bias.

Conclusion

The greatest challenge isn't about technology, skills, or ethics, important as they are, but about people management in the face of huge, impending change (Gifford and Houghton, 2019). Our role is to help customers confront that change and reach a point where they can not only cope, but thrive.

As one interviewee summarised:

"Progress will happen, it's human nature. We like to move forward, but it's also taking people with you and reassuring them that 'hang on, the future *is* for you, you're *not* excluded from that future and the change that is taking place'."

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