CDI Student Conference

Automation and the Graduate Labour Market

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Challenges for higher education career guidance arising from rapid automation and its impact on the labour market for Scotland's graduates

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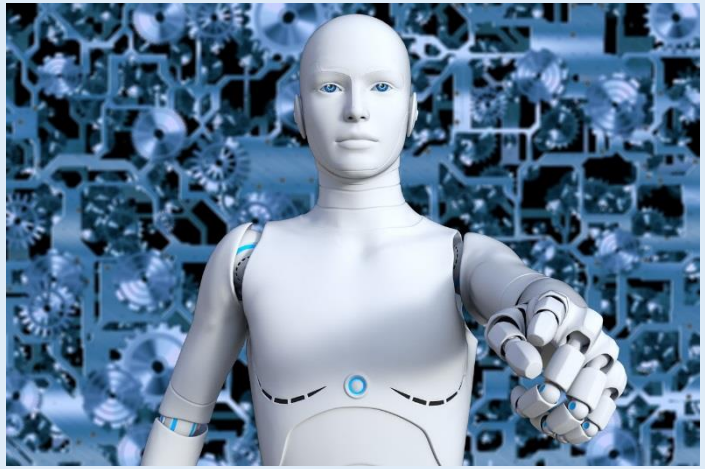
"Robots can be a boon , freeing up humans to do more productive things – but only so long as Humans create the systems to adapt their workforces , economies and societies to the inevitable disruption" (Ross, 2016 p37)

Background:

- Estimates for UK jobs at high risk of automation vary between 38% (Frey Osborne2013) and 12% (Nedelkoska and Quintini, 2018).
- Roberts, Lawrence and King (2017) estimate that 60% of occupations have 30% of tasks that can be automated.
- Jobs affected are **not confined to lower routine skill levels** due to artificial intelligence and machine learning – **a threat to the graduate jobs and the professions** (Susskind and Susskind 2015)
- Soaring inequalities in income levels whereby the dividends of technology go to a smaller number of owners and highly skilled workers to the exclusion of others.
- Women and minorities are over represented in job roles at higher risk of automation. (Roberts, Lawrence and King, 2017)



Are robots coming for the graduate jobs market?

Research Questions:

- Are the **models** of career development and **practice** of careers guidance delivery adapted to meet the needs of students in this period of rapid change?
- What are the **assumptions** careers advisers make about careers, job roles and the nature of work and do they take account of changing future scenario?
- Does practice take account of the idea that automation may impact genders and other groups disproportionately?
- Are there ways that careers advisers **challenge or mitigate** the effects of trends that could lead to greater inequality and a decline in working conditions for some workers?

Methodology

Semi-structured interviews

6 HE careers advisers specialising in business disciplines asking questions about models and practice

3 experts on the graduate labour market

Interview transcripts will be analysed using **thematic analysis** to identify themes and patterns of responses

Two relevant case studies will be developed

References

Ross, A. (2016) The Industries of the Future. New York: Simon and Schuster,

Frey, C.B and Osborne, M.A (2016) The Future of Employment: How Susceptible are Jobs to Computerisation? Oxford: Oxford Martin

Nedelkoska, L. and Quintini, G. (2018) Automation, skills use and training OECD Working paper

Susskind, R. and Susskind, D. (2015) The Future of the Professions how Technology will transform the work of human experts Oxford: Oxford University Press

Roberts C, Lawrence M and King L (2017) Managing automation: Employment, Inequality and Ethics in the Digital Age, IPPR. [on line] available: http://www.ippr.org/publications/managing-automation Accessed 29.12.2017

Methodology

- Qualitative study - Semi structured interviews with Careers Advisers and Labour Market “experts”.
- Concentrating on Higher Education and Business subjects as these are some of the areas such as Finance and Law where automation seems to be more prevalent/likely to affect jobs both in the sense of disappearing jobs and changing roles.
- 6 stage thematic analysis drawing out themes and issues that may have implications for practice.

Automation

- Automation is replacement of humans with machines to achieve results. Often not direct replacement – re engineer a process – bank tellers – on line/phone banking
- String of reports starting with Frey and Osborne 2013 estimating numbers of jobs susceptible to automation within next 15 – 20 years
- Based on occupational data and O- net job descriptions and identifying skills involved and how many technical barriers to automation of each occupation
- Yo yo up and down 38% , 9% Arntz Gregory Zierehan, 30% PWC Berriman and most recently OECD back to 12 % emphasises that these are predictions and not fact – question about how careers advisers use predictive LMI

Two views of automation

1 . It is the latest in a string of industrial shifts and each time the jobs that disappear have been replaced by new roles over time. Some skills are intrinsically human such as **creativity, judgement and morality, empathy** and cannot be replaced by machines. Institutions will step in to ensure that automation does not lead to mass unemployment and ensure that robots work for benefit of mankind.

2. AI and machine learning that are facilitating this revolution are intrinsically different from the processes that drove previous revolutions

It is more rapid, roles are not being created at the same rate as previously and in particular AI is taking over more cognitive less predictable tasks and that process will continue to move up the skill level.

Automation is already leading to greater structural inequalities and polarisation. Some believe it is boundless and warn it could lead to a post work society or at least one of huge polarisation between workers and “the rest”

Automation and Graduates

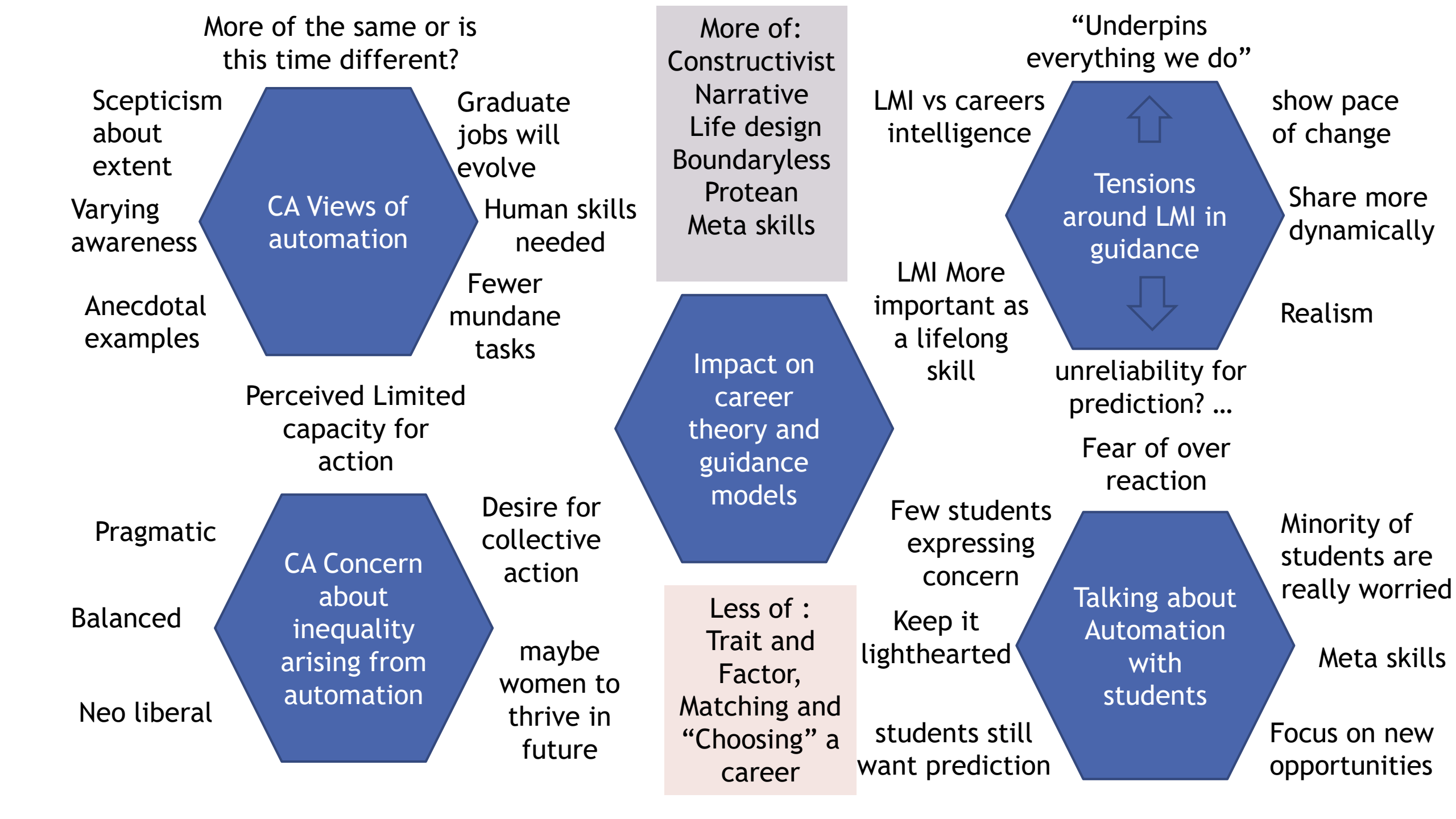
- Mixed views on how susceptible to automation graduate jobs are
- Everyone agrees that it is the middle ground and lower skills that are most at threat from technology
- Traditional view is that higher skills will be safe as they are not routine and too many barriers to automation and in any case expertise will be required to direct automation of jobs lower down the skills ladder. Some lower level skilled jobs are safer because they are low paid and not routine (sensorimotor skills (Brynjolffson and McCaffee)
- Susskind and Susskind (2015) undertook a qualitative study of professions making a strong case for the susceptibility of professions on basis that they are applied information and expertise that can be learnt
- 60 % of jobs have 30% of tasks that could be automated – McKinsey 2017

Inequalities

- Wealth concentrated in smaller numbers of workers and owners/entrepreneurs
  - Instagram App – created by 15 workers and sold to Facebook for $1m
  - Facebook employs 25,105 people (2017)
  - Kodak had 145300 employees in its heyday
- Unequal distributions of women/men particularly in safer STEM jobs that drive automation
- Platform effect - winner takes all
- Lovely/Lousy jobs

In the short to medium term automation will create an opportunity for those in work to make use of the innate human skills that machines have the hardest time replicating:

- non routine problem solving ie novel situations without masses of data to work with
- social and emotional capabilities, empathy
- coaching and developing others
- Imagination, Creativity and innovation
- Critical and systems thinking


More of the same or is this time different?
Scepticism about extent
Graduate jobs will evolve
Varying awareness
Human skills needed
CA Views of automation
Anecdotal examples
Fewer mundane tasks
Perceived Limited capacity for action
Pragmatic
Desire for collective action
CA Concern about inequality arising from automation
Balanced
maybe women to thrive in future
Neo liberal
More of:
Constructivist
Narrative
Life design
Boundaryless
Protean
Meta skills
Impact on career theory and guidance models
Less of :
Trait and Factor,
Matching and
"Choosing" a career
"Underpins everything we do"
LMI vs careers intelligence
show pace of change
Tensions around LMI in guidance
Share more dynamically
LMI More important as a lifelong skill
Realism
unreliability for prediction? …
Fear of over reaction
Few students expressing concern
Minority of students are really worried
Talking about Automation with students
Keep it lighthearted
Meta skills
students still want prediction
Focus on new opportunities

Careers Guidance is seen as crucial by many commentators (quote) but are we equipped?

Career Theory

- Trait and Factor based theories Parsons, Holland,
- Happenstance – rooted in Social Learning Theory and Chaos theory
- Life stages/life design (Super)
- Kaleidoscope, Boundaryless and Protean Career models
- Social Justice Model – Hooley et al
- Opportunity Structure model – Roberts

Guidance Models or Approaches

- GROW Goal, Reality, opportunity, way forward
- Narrative approach /Life Design
- High 5 Model (Canada)
- Counselling approach (Graham/Ali)
- DOTS/SODiT

Questions on career development theory/guidance models

- How useful do you think this theory or model is in explaining career development in 21st Century

For example:

- What are the assumptions the theory or model is based on and are they still valid?

- Does the theory or model emphasise the need for rapidly changing skill needs, flexibility and adaptability?

- Does the theory or model allow consideration of issues beyond work?

Question on inequalities arising from rapid automation.

- Increasing Polarisation between the wealthy and the low paid
- Lovely jobs/ lousy jobs and erosion of conditions of “employment”
- Unequal distributions of highly skilled work

- **Clearly Careers Guidance cannot solve these economic issues but is there more that career services could do to challenge or mitigate this negative impact for our clients?**