



QUEEN'S
UNIVERSITY
BELFAST



AI & EDUCATION

WHY, WHAT, AND HOW

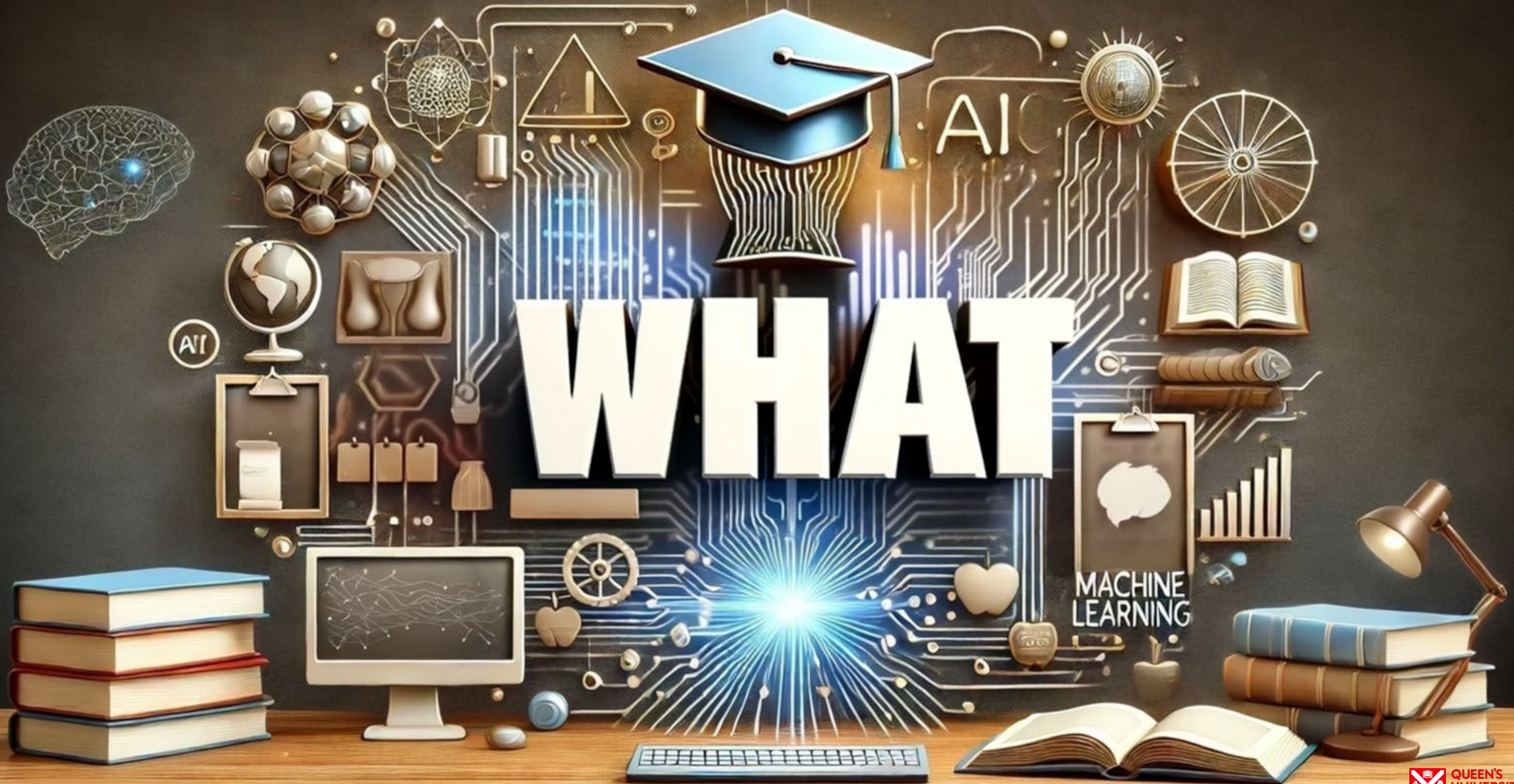
A TO DO LIST

MACHINE
LEARNING

AI



WHAT



GPQA

Graduate-level scientific questions across biology, physics, and chemistry.

Model	Diamond Set (Zero-shot CoT)
Claude 3.5 Sonnet	59.4%
GPT-4o	53.6%
Gemini 1.5 Pro	46.2%
GPT-4	35.7%
GPT-3.5	28.1%

- PhD level experts – 65%
- Highly-skilled non-expert - 34% (Google + 30mins/question)

MATH

Arithmetic reasoning benchmark of competition mathematics problems.

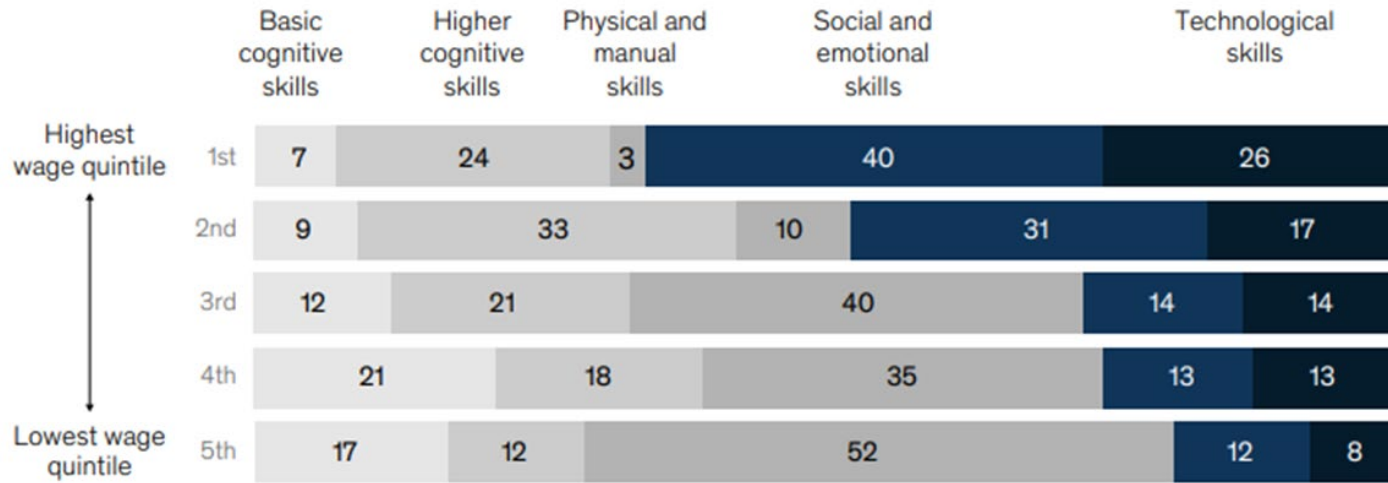
Model	Score
GPT-4o	76.6%
Claude 3.5 Sonnet	71.1%
Gemini 1.5 Flash	67.7%
GPT-4	52.9%
GPT-3.5	34.1%

AI will change many roles...

TEACHING A SKILL

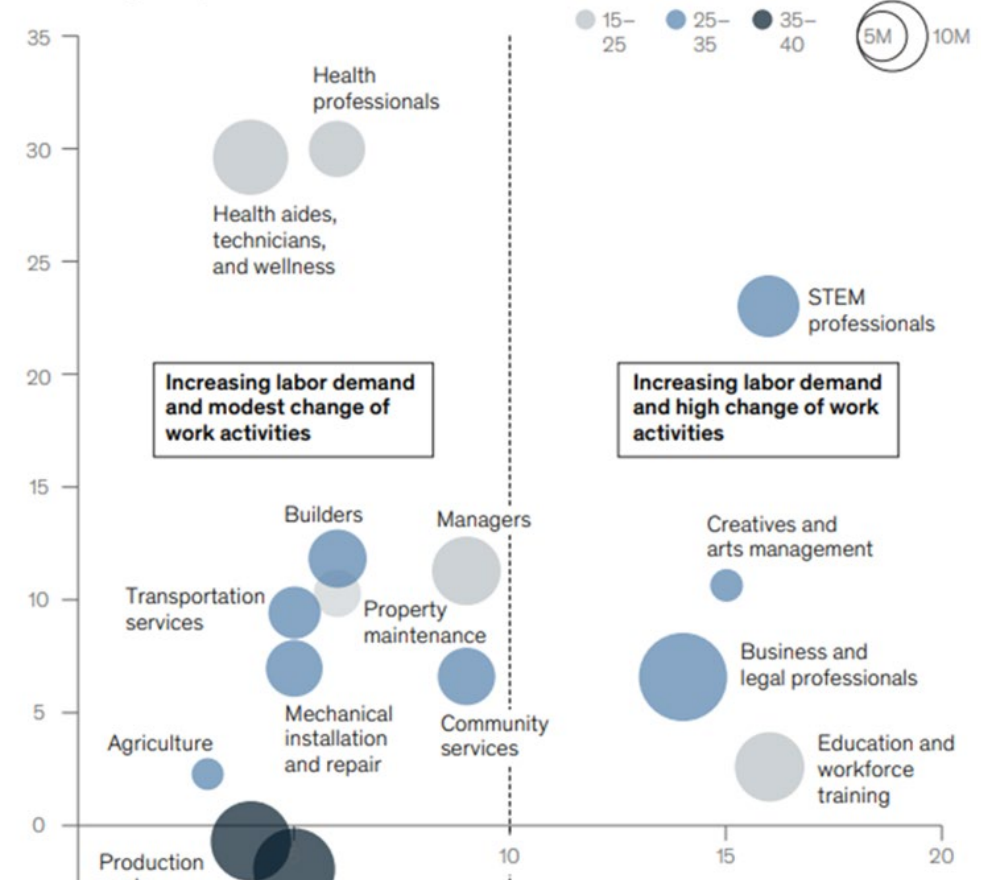
Time spent using various types of skills by wage quintile in the United States,¹ 2030, %

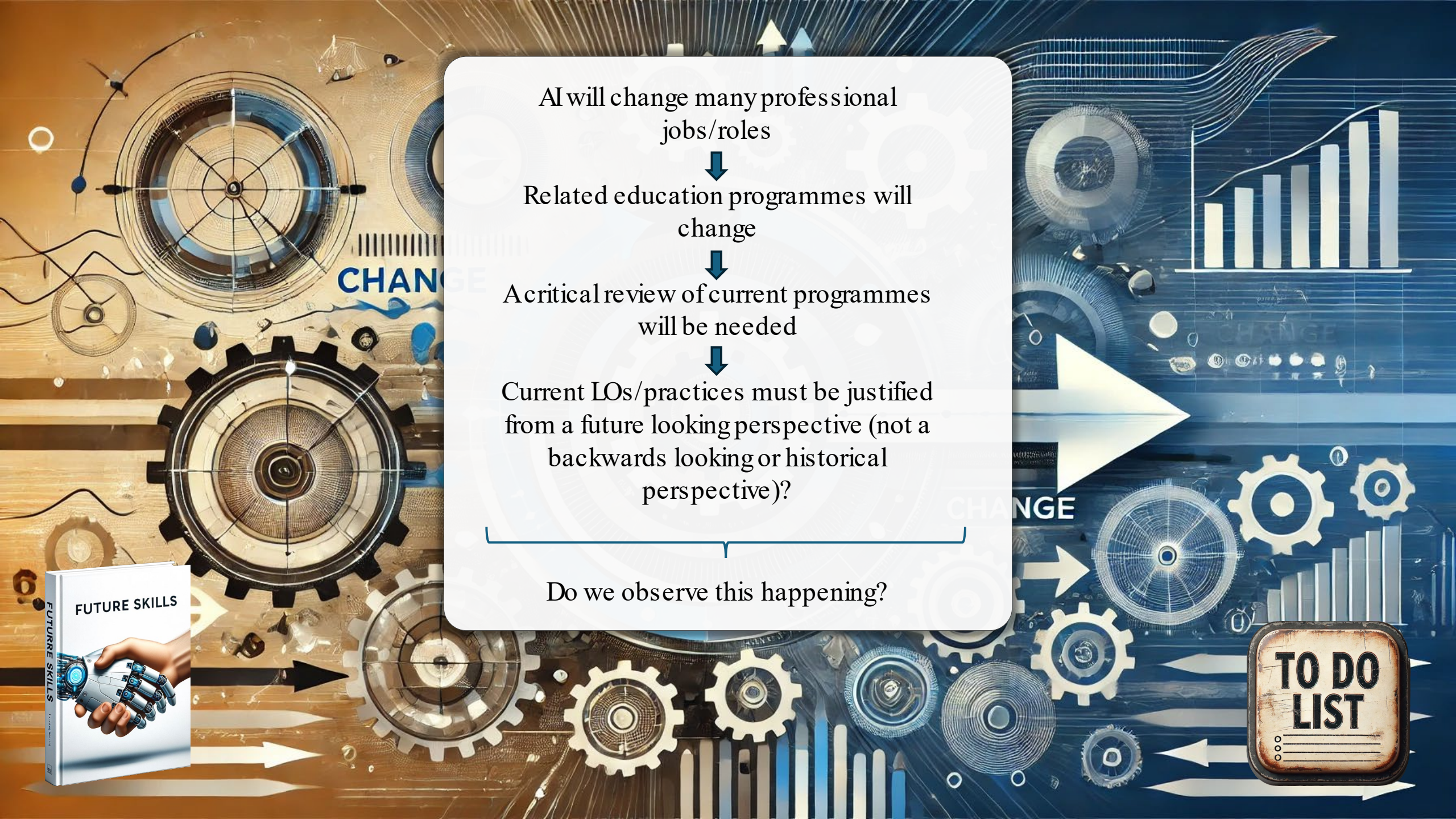
Midpoint automation scenario, with generative AI acceleration



References

- McKinsey & Company (2023), The state of AI in 2023: Generative AI's breakout year
- OECD (2023), OECD Employment Outlook 2023: Artificial Intelligence and the Labour Market





AI will change many professional
jobs/roles



Related education programmes will
change



A critical review of current programmes
will be needed

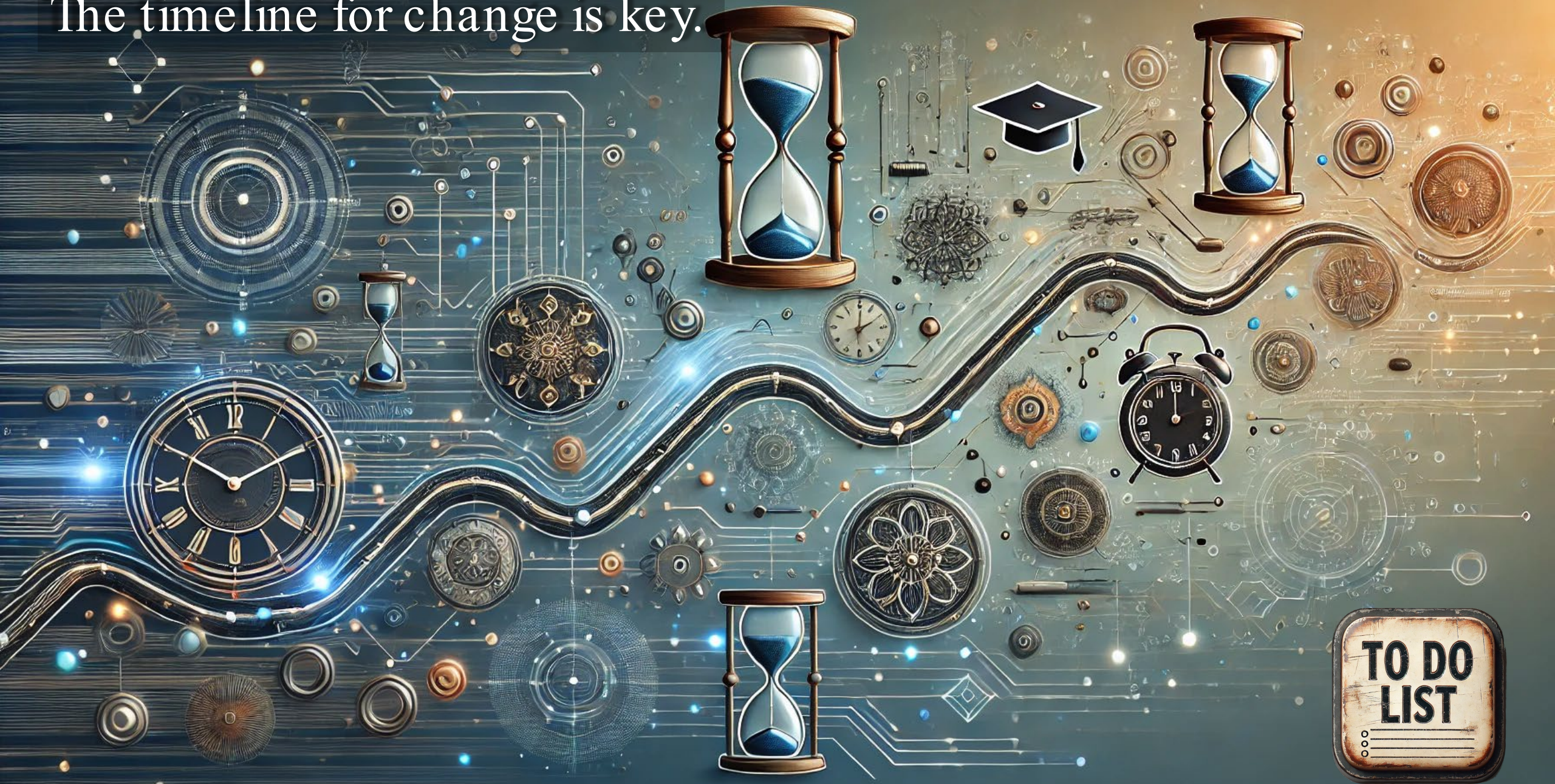


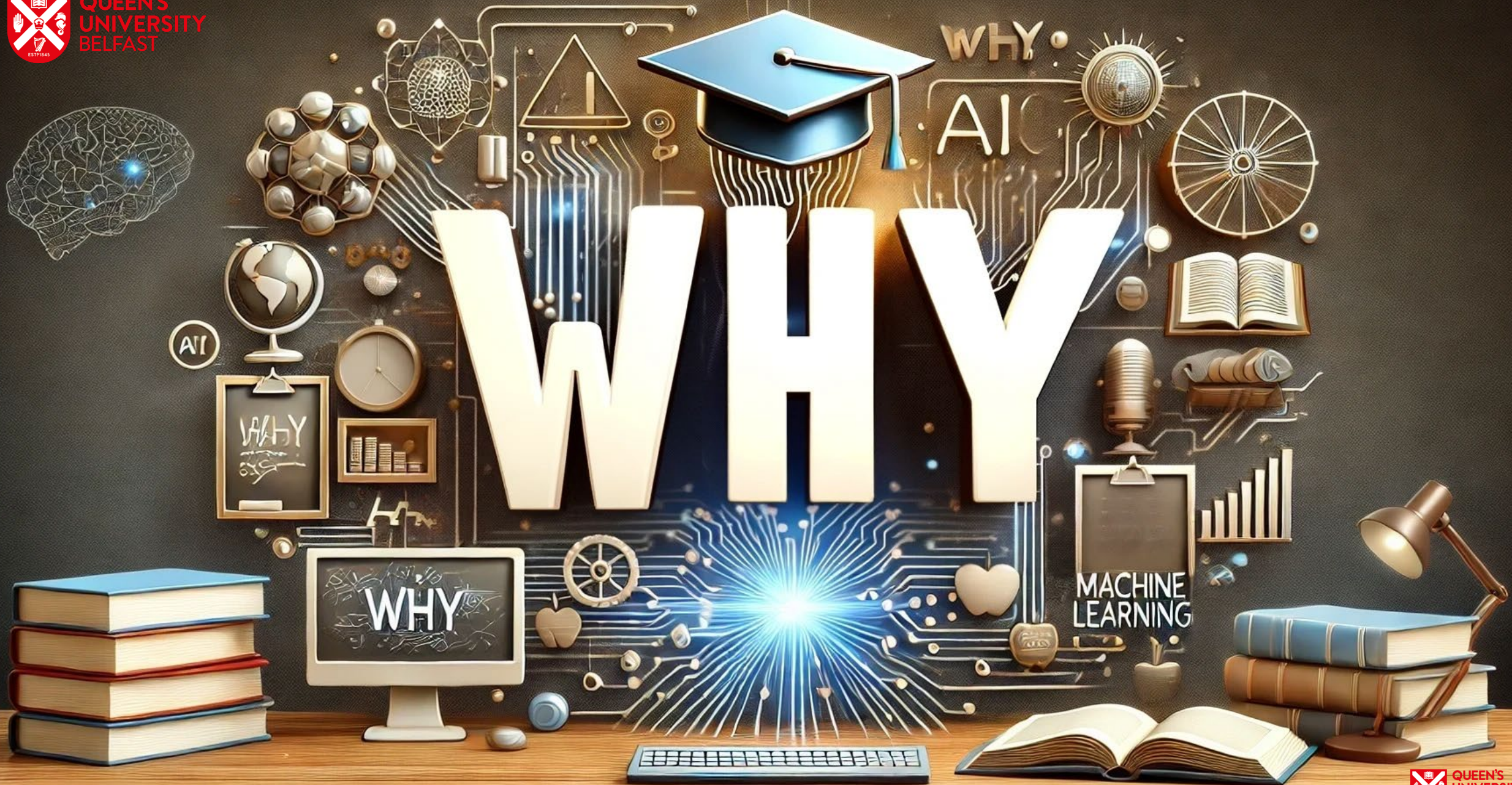
Current LOs/practices must be justified
from a future looking perspective (not a
backwards looking or historical
perspective)?

Do we observe this happening?

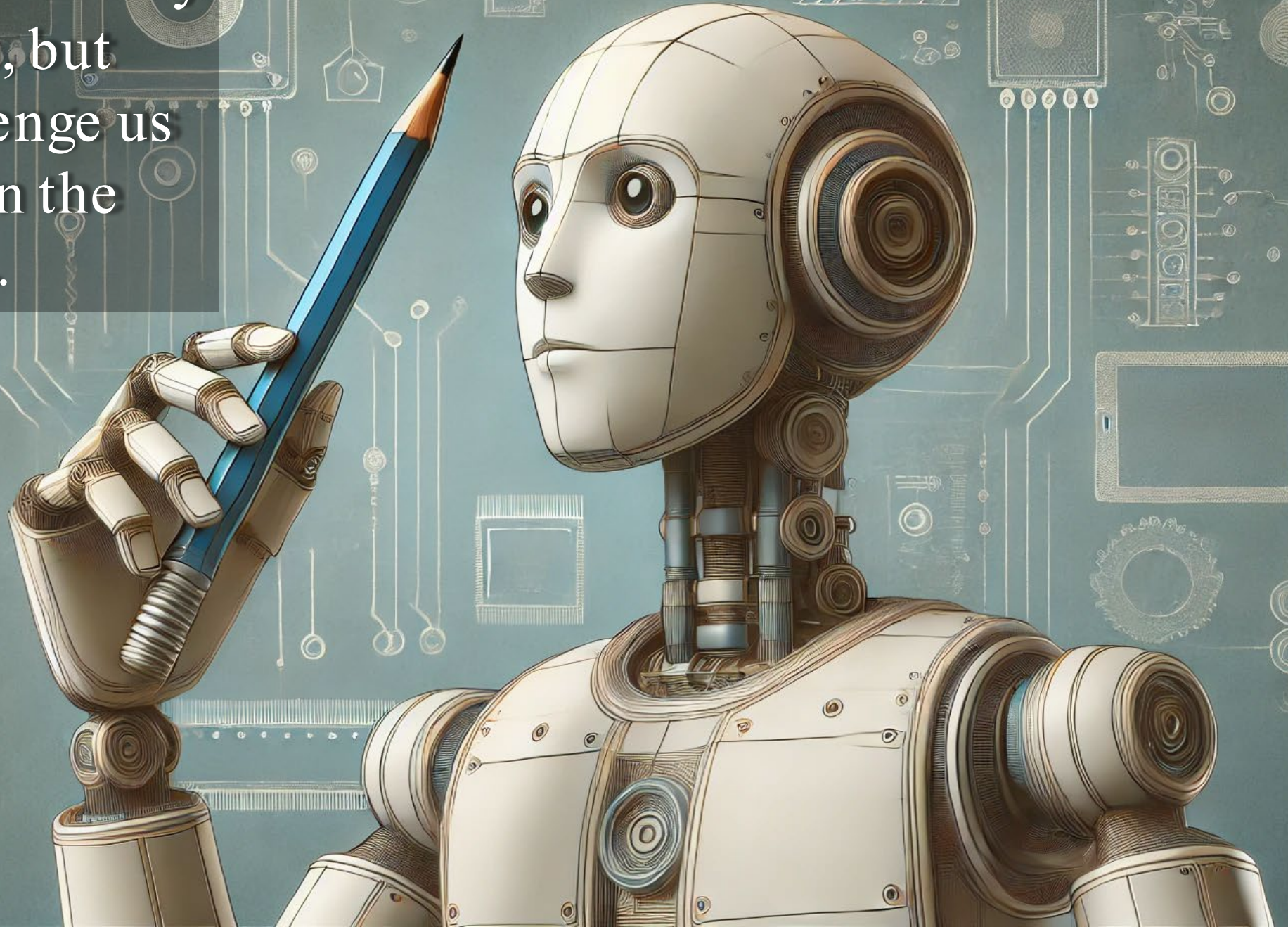


The timeline for change is key.





AI will change not only
what we teach, but
will also challenge us
to be clearer on the
reasons why...



EDUCATION

AI can result in better education outcomes. Yet, it can also undermine learning if used as a shortcut; replacing or diminishing the learner's own effort

The line is fine but clear - AI should be used as a tool for growth, and not to sidestep the hard work required to develop mastery.



We need to actively engage our students in meaningful discussions about the responsibilities of being a learner and the purpose behind the learning tasks we assign.

Alongside this, we will need a small number of robust checkpoints or progress gates.





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AI



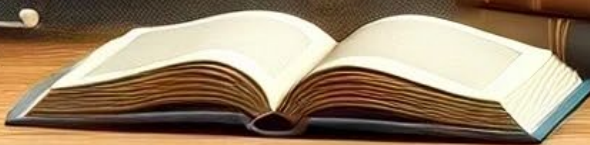
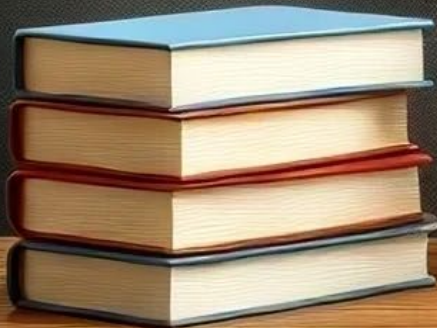
AI



HOW



MACHINE
LEARNING



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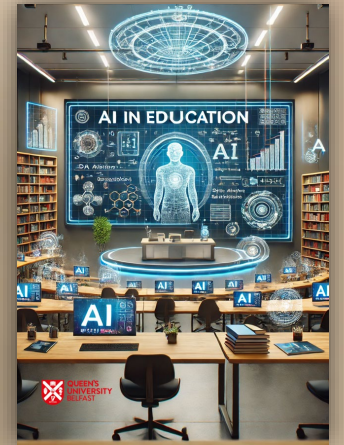
This is a shared problem, with a joint solution required.

- Institutional: Policies, Systems, Capabilities, Support.
- Programme: Skills and Competencies, Course design, Benchmarking (PSRBs).
- Individual: Learner engagement, activities and support.



Institutional:

- Policies: Values, Equity, Inclusion, Accountability, Safety.
- Horizon Scanning: AI Capabilities, Jobs & Skills.
- Innovation Support: Resourcing, Scaling.
- Knowledge Base: Case studies, Reports, Guides.
- Training and Support: Staff, Students.
- Systems: Staff, Student, Services.



Individual:

- Virtual course assistant: Interactive course guides, provide real-time Q&A.
- Build practice content: Produce quizzes and tests, create practice exams.
- Enhance feedback: Expand feedback, generate suggested improvements.
- Personal tutor: Explain course concepts, offer learner guidance.
- Improve accessibility: Reformat course materials, multilingual translations.



