

Challenges and opportunities in integrating AI into teaching and learning

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Generative AI

Challenges and opportunities for learning and teaching

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Director, Technology Initiatives

What's next...

What is generative AI?

- A branch of artificial intelligence (AI) to describe a class of algorithms capable of creating new content
- Includes content like text, images, videos, audio
- Evolved from advances in deep learning, e.g., transformers

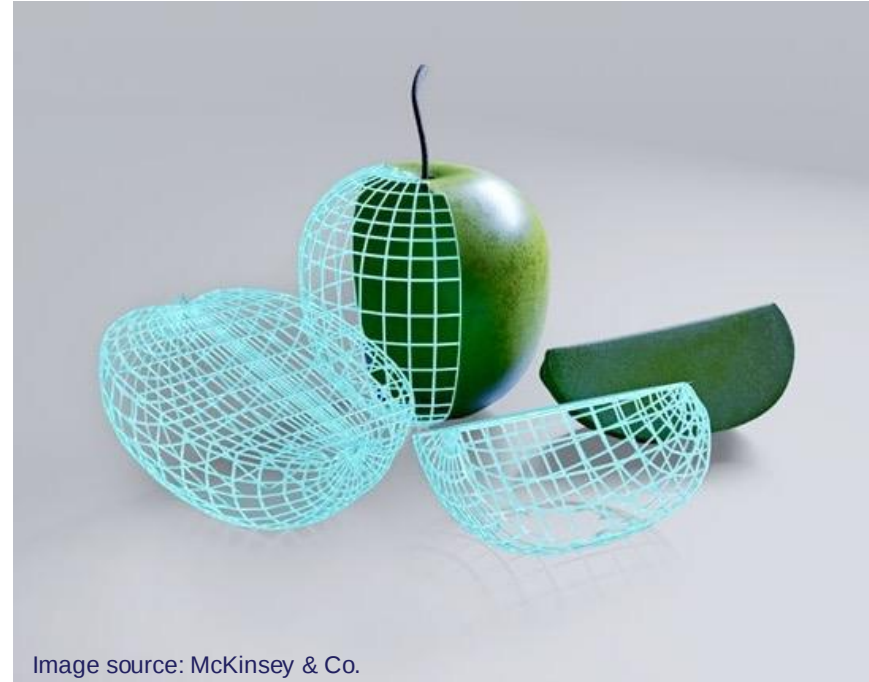


Image source: McKinsey & Co.



- Why generative AI is getting all the hype?
- Benchmarks
 - Mathematics
 - Coding
 - General knowledge
 - Reasoning (HellaSwag)
 - MMLU

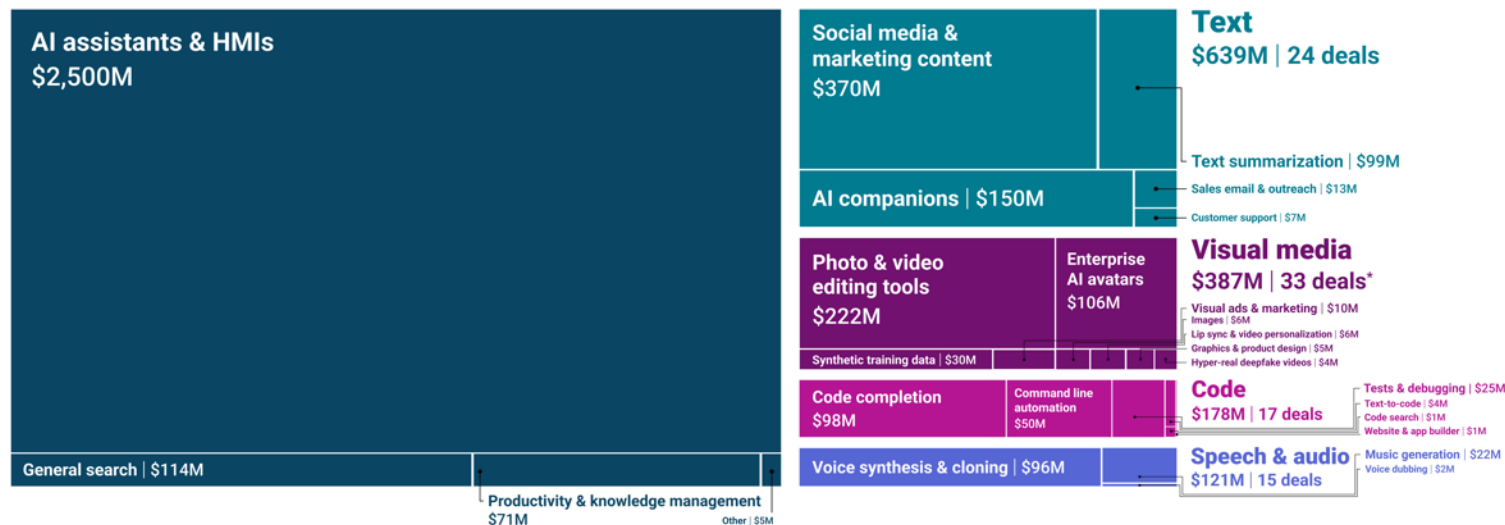


Where is all the money going in generative AI?

Distribution of generative AI funding, Q3'22 – Q2'23

Generative interfaces

\$2,690M | 23 deals



Source: CB Insights. Based on an analysis of 210+ generative AI companies building cross-industry enterprise solutions; excludes deals to industry-specific companies and model developers such as OpenAI.

*Includes 1 deal in motion capture animation and 1 deal in synthetic anonymization with undisclosed funding.

Regulations differ!

Aspect of AI Regulation	Australia	Singapore	United States	China	Vietnam	European Union
Comprehensive AI Regulation	No specific AI regulations – in draft with over 500 submissions	Developing comprehensive AI governance	No comprehensive federal AI regulations	AI regulation framework in development *	No comprehensive AI regulations	EU Artificial Intelligence Act (AIA)
Data Protection Laws	Privacy Act 1988, sector-specific laws	Personal Data Protection Act (PDPA)	Sector-specific regulations, GDPR	Cybersecurity Law, Data Security Law	Cybersecurity Law	General Data Protection Regulation (GDPR)
Ethical Guidelines	AI Ethics Framework, AI Action Plan + NAIC's RAIN work	Developing ethical AI guidelines	FTC guidance, principles by agencies	Developing ethical guidelines and standards	Ethical principles under development	EU's Ethical Guidelines for Trustworthy AI
Sector-Specific Regulations	Various existing laws may apply	MAS guidelines for financial sector	Sector-specific regulations	Sector-specific regulations	Sector-specific regulations	Sector-specific regulations
Risk Categorization	N/A – proposed in AI regulatory draft	MAS guidelines for AI and data analytics	N/A	N/A	N/A	AI Act categorizes AI systems by risk
Certification Schemes	N/A	Exploring certification schemes	N/A	Developing certification schemes	N/A	Developing certification schemes

Our contributions to public discourse

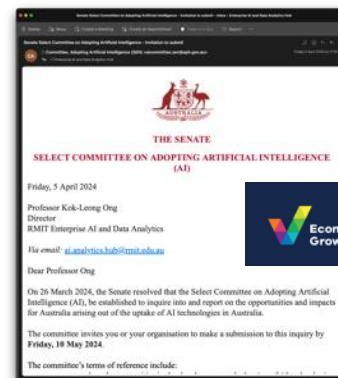
- The Hub has been invited to contribute our views to AI developments in Australia
- Invited to submit our recommendations to the Senate Select Committee on AI in May 2024
- Invited to contribute our views to the Economic Growth Victoria's AI project



Read our senate submission
on the aph.gov.au website.



Read our submission to the
Department of Industry,
Science and Resources



AI and the next generation

- AI will be like the air and water that our next generation is born into – a necessity in their life
- Their expectations and world view will be **fundamentally different** to the world we know as technology **accelerate the pace of change**
- We are already seeing this, e.g., ‘lie flat’ in China or ‘quiet quitting’ in some western cultures
- AI will have a significant role in future social changes

Budget 2024 debate: Desmond Choo on AI and the new economy and challenges faced by younger Singaporeans



27 Feb 2024 04:46pm

How can Singapore ensure that its youths are ready for artificial intelligence (AI)? Institutes of Higher Learning include AI in all courses and do all our workers and now need to have AI booster courses? MP Desmond Choo...see more

NEWS > COMPANY NEWS

Nvidia Plans Expansion in Vietnam With Focus on AI Development

By FATIMA ATTARWALA Published December 11, 2023



Bloomberg / Contributor / Getty Images

KEY TAKEAWAYS

- Nvidia CEO Jensen Huang said the company plans to expand partnerships in Vietnam.
- Huang also expressed interest in establishing a second base in Vietnam and contributing to the country's semiconductor ecosystem development.
- The move could help Nvidia diversify its supply chain.

AI's transformational effect on business paradigms will have an impact to the workforce

AI talent development

- AI disruption is across disciplines
- Skills development is no longer the realm of a single disciplinary entity, e.g., NTU's B. Sc (AI and Society)

Meet Hailey.
Human or AI?
Get ready for the AI revolution.

POWERED BY
GenAI

Enter the world of AI at NTU

College of Computing and Data Science

Put yourself at the forefront of the AI revolution at the new College of Computing and Data Science (CCDS) where critical thinking, creativity and leadership are shaping the future. A hot bed of cutting-edge technology and groundbreaking research, the college will groom the next generation of leaders, thinkers, and innovators to thrive in the digital age.

Learn from some of the best minds in AI across academia and industry through exclusive masterclasses, one-on-one mentorship, and exchange programmes at leading global universities. Initiatives such as Generative AI Lab and Institute of Computing & Society will offer you the opportunity to benefit from interdisciplinary collaboration and address societal challenges brought about by AI.

Immerse yourself in a hands-on experience at CCDS that goes beyond the classroom and get ready to lead trailblazing projects, spearhead advancements, and contribute to a future where your ideas matter. Join us as we redefine what comes next.

Dean's Message

Prof. Luke Ong
Distinguished University Professor,
Vice President (Research),
Incoming Vice President (AI & Digital Economy) and Dean, College of Computing and Data Science

Welcome to NTU's newest academic college, College of Computing and Data Science (CCDS).

This strategic initiative comes at an exciting time, as computing, data science and artificial intelligence (AI) reshape our world.

[Read more](#)

Named World's Top 10 Best AI and Data Science Undergraduate Courses
FORBES
NTU Data Science and AI Programme

NTU Ranked #2 globally for AI
US NEWS AND WORLD REPORT

Challenge 1: AI risks in L&T

Risk Consequence Rating Tool

Purpose Of The Tool

We use this 'Risk Consequence Rating Tool' to enable the consistent assessment of potential risk impacts. This tool defines the criteria to rate the consequences and allows consistent assessment of risks across the university.

How To Use The Tool

Using the explanation under the different consequence criteria (Education & Research, Student Experience etc) identify the most relevant measures related to your risk. You may have one or more consequence criteria (i.e. Financial and Student Experience) that apply to the risk. When identifying the rating always use the highest associated rating as the final rating (e.g. Financial = Major, Student Experience = Severe, you would therefore select the highest out of the two which would be Severe).

Risk Consequence Criteria									
Rating	Description	Education & Research	Student Experience	Reputation & Image	Financial	People, Safety & Environment	Business Interruption	Legal, Regulatory and Compliance	
5	Exceptional impacts on operations or objectives	- Inability to undertake operations and activities of a College - Extreme reduction in research activity / output over a sustained period - Inability to reach a number of students, teaching or research targets - Irreparable impact on relationships with partners / collaborators / suppliers	- Extreme loss or reduction in University-wide student enrolment and retention - Systemic and extreme decline in overall student satisfaction across the University - Systemic and extreme increase in the student complaints across the University	- Long-term change in the University's reputation across all stakeholder groups and general public - Extended headline national and/or international media coverage - Extensive and prolonged discussion across multiple social media channels	>\$50M	- Single or multiple fatalities - Serious disabling physical or mental illness to multiple people - Extreme environmental damage (> 5 years)	- Loss of critical business processes or research output greater than 1 day - Significant loss of strategic value to deliver for period without	Systemic and sustained	
4	Significant impacts on operations or objectives	- Inability to undertake operations and activities of a School - Significant impact on research activity over a sustained period - Significant problems meeting teaching or research targets - Serious long-term damage to partnerships / suppliers	- Significant loss or reduction in University-wide student enrolment and retention - Severe decline in overall student satisfaction across multiple Colleges - Severe increase in student complaints across multiple Colleges	- Medium-term change in the University's reputation across multiple stakeholder groups - Headline coverage at national level in multiple media sources for more than a week - Discussion across multiple social media channels for more than a week	\$50M to \$10M	- Severe irreversible damage or impairment to one or more people - Irreversible health effect or medium to long term disabling illness - Long term environmental damage (2-5 years)	- Loss of critical processes or research output between 1-5 days - Severe damage - One or more employees unable to extended period without		
3	Large impacts on operations or objectives	- Inability to deliver a program or course - Major impact on research activity - Major problem meeting teaching or research targets - Major but short-term damage to partnerships / suppliers	- Major loss or reduction in student enrolment and retention for a program or course - Major decline in overall student satisfaction across a College or multiple Schools - Major increase in student complaints across a College or multiple Schools	- Medium-term change in the University's reputation across limited stakeholder groups - Headline coverage at national level in multiple media sources for less than a week - Discussion across multiple social media channels for less than a week	\$10M to \$30M	- Reversible injury or moderate irreversible damage or impairment to one or more people. Typically an injury resulting from loss of a scheduled shift of work (i.e. Loss Time Injury) - Severe, reversible mental or physical health effect of concern that would typically result in a lost time illness - Medium term environmental damage (2-5 years)	- Loss of critical processes or research output between 1-1 day - Major damage - One or more employees unable to sustained period		
2	Material impacts on operations or objectives	- Material impacts to the delivery of a program or course - Major impact on research activity - Moderate impact on research activity - Moderate but temporary problems meeting teaching or research targets - Material but short-term damage to partnerships / suppliers	- Moderate loss or reduction in student enrolment and retention for a program or course - Moderate decline in overall student satisfaction across a School - Moderate increase in student complaints across a School	- Some short-term change in the University's reputation - Low profile and fleeting coverage by national or state media - Discussion across some social media channels by isolated stakeholder groups	\$10M to \$30M	- Reversible injuries requiring treatment but does not lead to restricted duties. Typically a medical treatment - Reversible health effects of concern that would typically result in medical treatment - Short term environmental damage (< 2 years)	- Material and/or disruption to processes or research output over an inconsequential period - Moderate damage - Supplier or partner results in minor results in more than a period of		
1	Slight impacts on operations or objectives	- Minor impacts to the delivery of a program or course - Minor impact on research activity - Slight but temporary problems meeting teaching or research targets - Minor but short-term impacts to partnerships / suppliers	- Slight loss or reduction in student enrolment and retention for a program or course - Some decline in overall student satisfaction across a School - Some increase in student complaints across a School	- Minimal impact on the University's reputation - Minimal state and local media coverage - Limited social media coverage	<\$1M	- Low level short term subjective inconvenience or symptoms. Typically first aid or no medical treatment - Reversible health effects of little concern, requiring first aid treatment at most - Minor environmental damage	- Slight and local disruption to business or educational operations. In deal with routine operations - Minor damage - Supplier or partner results in minor results in more than a period of		

Risk Exposure

Purpose of the Tool
We use the Risk Exposure focus your efforts and management oversight.

Risk Exposure Matrix		Minor (1)	Medium (2)	Medium (3)	Low (4)
Likelihood Rating	Almost Certain (E)				
	Likely (D)				
	Possible (C)				
	Unlikely (B)				
	Rare (A)				

Risk Exposure Rating Tool

Purpose of the Tool

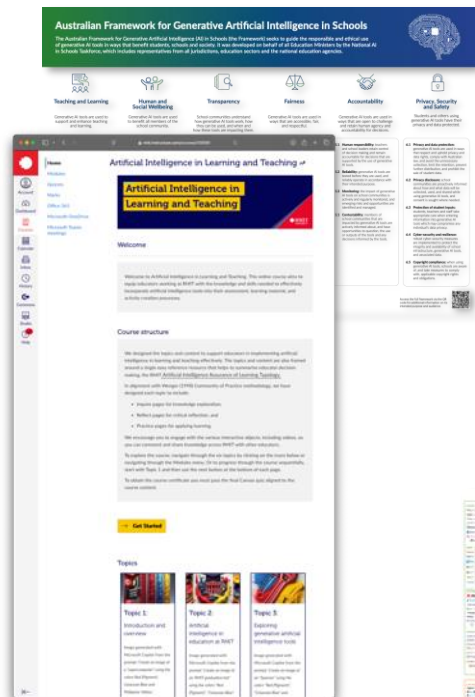
We use the 'Risk Exposure Rating Tool' to highlight the severity of the risks (i.e. Low, Medium, High, Critical). This in turn helps determine which risks you should focus your efforts and resources on. The tool also highlights the implications associated with the different ratings for aspects such as: impact on objectives; management oversight; reporting; and review.

Risk Exposure Matrix	Consequence Rating					Risk Exposure Ratings	
	Minor (1)	Moderate (2)	Major (3)	Severe (4)	Extreme (5)	Rating	Description
Almost Certain (E)	Medium	High	Critical	Critical	Critical	Critical	- Objectives will not be achieved - Requires relevant management's highest priority and urgent attention - Risk must be approved, visible and reported to at least the Vice Chancellor's (Executive level or equivalent) - Risk must be reviewed at least every 6 months
Likely (D)	Medium	Medium	High	Critical	Critical	High	- Achievement of objectives under serious threat - Requires relevant management's priority and active involvement - Risk must be visible and reported to at least the Executive Director level (or equivalent) - Risk must be reviewed at least every 6 months
Possible (C)	Low	Medium	High	High	Critical	Medium	- Some threat to achievement of objectives - Requires relevant management's active monitoring - Risk must be visible and reported to at least the Director level (or equivalent) - Risk must be reviewed at least annually
Unlikely (B)	Low	Low	Medium	High	High	Low	- Achievement of objectives not under threat - Can be dealt with in normal course of business - Risks must be visible and reported to at least the Senior Manager level (or equivalent) - Risk must be reviewed at least annually
Rare (A)	Low	Low	Low	Medium	High		

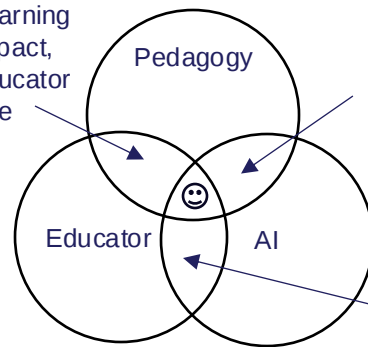
How To Use The Tool

The 'Risk Exposure Rating Tool' is used to evaluate risks based on the severity of their consequence and their likelihood to occur. To evaluate the risk exposure use the 'Consequence Rating Tool' to define the consequence rating and the 'Likelihood Rating Tool' to define the likelihood rating. Once you have ascertained these two ratings you can then plot what the risk exposure rating is (i.e. Low, Medium, High or Critical) from the matrix above. To understand the implications of each rating, refer to the descriptions in the Risk Exposure Ratings table on the right.

Challenge 2: AI fluency

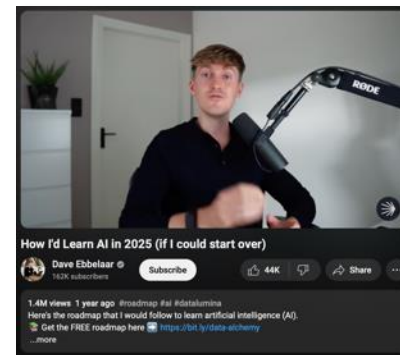
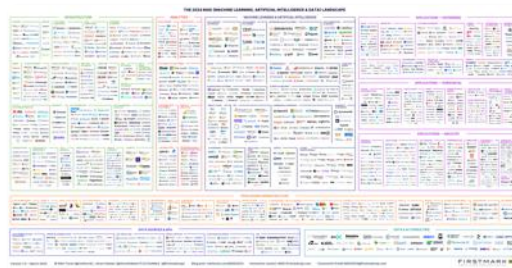


Learning
impact,
educator
role



Right
pedagogy and
right AI tool

Risks,
keeping up
with new
technology



Challenge 3: AI for pedagogy (EdTech)



Challenge 4: AI discipline skilling

Sector	TSC CCS Category	TSC CCS Title	TSC CCS Description
Accountancy	Business Management	Performance Management	Measure and manage business performance
Accountancy	Business Management	Professional Skepticism and Judgment	Assess evidence to make informed decisions about the appropriate course of action
Accountancy	Business Management	Project Feasibility	Advocate standards development to promote public confidence and build trust in society
Accountancy	Business Management	Project Execution and Control	Implement projects in accordance with project plan and deliverables, and monitoring and controlling processes
Accountancy	Business Management	Project Feasibility	Study project feasibility to meet project outcomes and objectives
Accountancy	Business Management	Project Management	Execute projects by managing stakeholder engagement, resources, budgets and resolving problems
Accountancy	Business Management	Stakeholder Management	Manage stakeholder expectations to ensure continuous levels of engagement by identifying and addressing needs
Accountancy	Business Management	Systems Thinking	Understand complexity of cause-and-effect relationships of systems and processes across the organisation, as well as
Accountancy	Digital and Data Management	Accounting and Tax Systems	Implement accounting or tax software systems in the organisation
Accountancy	Digital and Data Management	Cyber Security	Develop awareness of cyber security threats
Accountancy	Digital and Data Management	Data Analytics	Apply data extraction and analytic methods to analyse and evaluate financial and non-financial information and
Accountancy	Digital and Data Management	Data Governance	Develop, implement and practice guidelines, laws, and regulations across the organisation for the handling of data
Accountancy	Digital and Data Management	Data Storytelling and Visualisation	Combine data insights, dynamic visual displays with illustrative and interactive graphics and narrative representation
Accountancy	Digital and Data Management	Digital Forensics	Use forensic technologies in the delivery of forensic services
Accountancy	Digital and Data Management	Digital Technology Adoption and Innovation	Develop digital technology enhancement projects to support the organisational objectives
Accountancy	Digital and Data Management	Digital Technology Environment Scanning	Evaluate the digital technology environment and the impact of digital technology development
Accountancy	Digital and Data Management	Evidence Management	Employ forensic research methodologies to collect and manage data
Accountancy	Digital and Data Management	Forensic Data Analytics	Interpret and analyse data using statistical techniques to uncover trends and patterns in finance and accounting data
Accountancy	Digital and Data Management	Information Security and Data Privacy	Develop awareness of various risks related to Information Technology (IT), information security and data privacy
Accountancy	Digital and Data Management	Programming and Coding	Develop technical capabilities to understand, design and write instructions to be processed by computers as software
Accountancy	Financial and Transaction Management	Accounting Standards	Apply financial reporting framework prescribed by the relevant governing body to ensure all transactions meet requirements
Accountancy	Financial and Transaction Management	Capital Expenditure and Investment Evaluation	Assess investments based on alignment with strategies, affordability, acceptable returns and prioritisation of opportunities
Accountancy	Financial and Transaction Management	Raising Capital	Acquire or raise capital and funds to carry out organisational goals and objectives
Accountancy	Financial and Transaction Management	Cash Flow Management	Manage and maintain business units' cash flow by consolidating data and performing analysis on cash inflow and
Accountancy	Financial and Transaction Management	Claims Management	Coordinate and carry out timely and accurate adjudication, validation and disbursement of claims proceeds to creditors
Accountancy	Financial and Transaction Management	Cost Management	Analyse, plan and manage costs for cost efficiency and expense reduction
Accountancy	Financial and Transaction Management	Credit Risk Management	Establishing the organisation's financial and credit policies to identify, assess and manage the credit risk
Accountancy	Financial and Transaction Management	Debt Restructuring	Assess processes to address risk of default on existing debt or evaluate opportunities to take advantage of lower interest rates
Accountancy	Financial and Transaction Management	Financial Analysis	Analyse the financial statements and data to provide insights about the financial performance and position of the organisation
Accountancy	Financial and Transaction Management	Financial Closing	Carry out month-end closing and reconciliation to ensure financial records are maintained properly
Accountancy	Financial and Transaction Management	Financial Management	Ensure healthy financial aid to business growth and operations
Accountancy	Financial and Transaction Management	Financial Modelling	Develop financial models and valuation models to arrive at a valuation conclusion
Accountancy	Financial and Transaction Management	Financial Planning	Evaluate and develop budget in line with organisation's strategies and plans
Accountancy	Financial and Transaction Management	Financial Reporting	Prepare general-purpose financial statements and disclosure notes in accordance with applicable financial reporting standards
Accountancy	Financial and Transaction Management	Financial Reporting Quality	Establish internal control framework for audit purposes
Accountancy	Financial and Transaction Management	Financial Statements Analysis	Analyse financial statements in accordance with the applicable frameworks
Accountancy	Financial and Transaction Management	Financial Transactions	Prepare business documentation and cash balances
Accountancy	Financial and Transaction Management	Group Accounting and Consolidation	Apply group accounting and consolidation of separate organisations to create a single entity

CPA AUSTRALIA

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Get involved / Academic institution support / Professional accreditation guidelines

Section 1: Principles underlying accreditation

The professional bodies are committed to ensuring excellence in accounting...

→

Section 2: Accreditation standards

The professional bodies have jointly developed the accreditation standards...

→

Section 3: Technical and professional competency areas and learning outcomes

A professionally accredited degree program must not only produce graduates...

→

Section 4: Accreditation process

We encourage higher education providers to use the following information...

→

Section 5: Frequently asked questions

Learn more by reading our FAQs relating to the requirements, process and...

→

Section 6: Accreditation submission templates

The following section provides the templates that need to be completed for...

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Appendix 1: Glossary

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Appendix 2: Technical competency areas and learning outcomes

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Appendix 3: Professional competency areas and learning outcomes

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Appendix 4: Twinning arrangements – additional requirements

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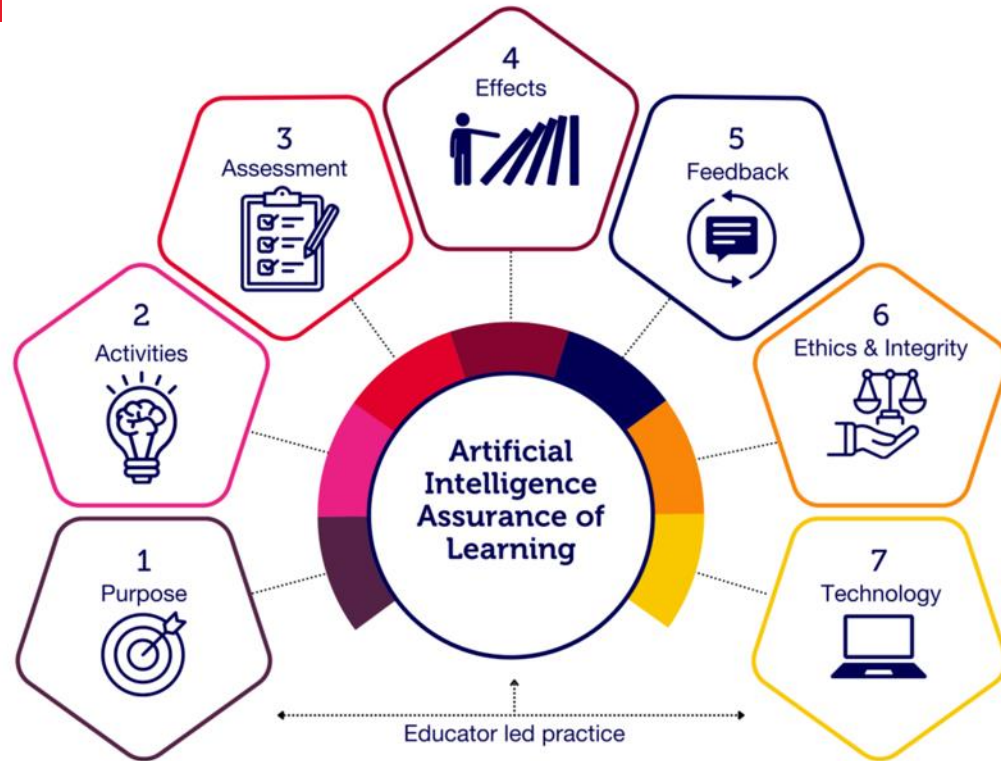
Appendix 5: Threshold learning outcomes

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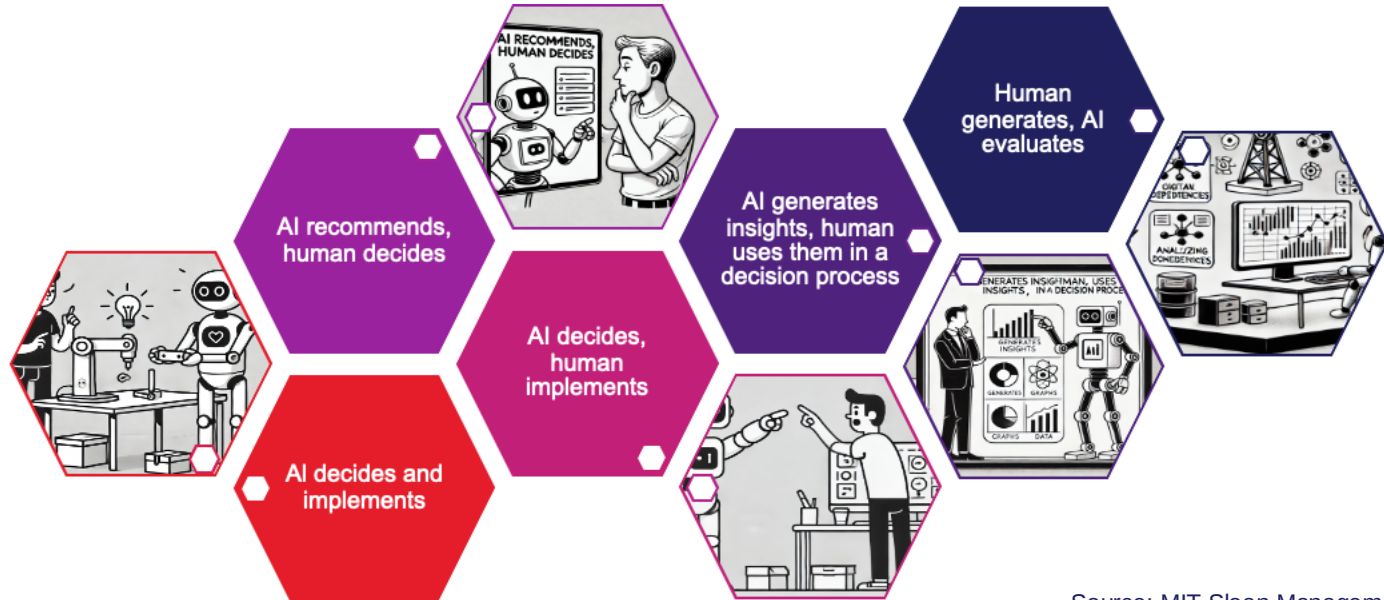
Purpose of accreditation guidelines

The primary purpose of professional accreditation of higher education accounting programs is to assure the quality of educational programs, their providers and to promote improvements in accounting education quality.

Challenge 5: AI assurance of learning



Challenge 6 (or opportunity for L&T): Developing human skills in the AI world



Source: MIT Sloan Management Review.
(n.d.). Expanding AI's Impact With Organizational
Learning. Retrieved September 5, 2024

Q&A Session



AI-driven instructional design and Introduction of AI-powered LMS co-designed with 8 Universities

Dr Shroff (Session 1)

AI makes us more human: AI challenges help define our unique human contribution

Prof Berg (Session 1)

3D Social Environment to facilitate knowledge transfer and idea generation

Prof Wong (Session 2)

Do you think that Artificial Intelligence rules over human beings?

Prof Kim (Session 3)

Gamification:

- Foodbank: Solving real-world problems
- Goati: Exciting and fun (and a bit addictive)
- Hospital: Managing healthcare resources & developing business capabilities

Prof Vesty (Session 2)

AI will be like the air and water that our next generation is born into – a necessity in their life

Prof Ong (Session 3)

Your Feedback Shapes Future Sessions

Session 3



Next Steps

- Recordings and Presentations
- Certificate of Completion
- What's Next...



THANK YOU

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