





WIHEA Online Masterclass

Barriers of Using GenAI in Education




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1. Project funded through Warwick's Education Fund, Jan - July 2025
 - 'Identifying Barriers and Use Cases for Generative AI in Education Using Retrieval-Augmented Generation and Staff Surveys', https://warwick.ac.uk/ai_barriers
 2. 1,998 relevant full-text articles (literature) and 273 survey responses (Warwick) were collected and analysed.
 3. Main results:
 - GenAI in education has a complex usage and barrier landscape.
 - There are significant differences in barriers between STEM vs non-STEM subjects, and teaching vs non-teaching staff members.
 4. Potential actions:
 - GenAI policy is not one-size-fits-all, and there is a need to design discipline and role-specific adoption strategies.
 - The level of complexity and profound impact calls for a more effective and adaptive governance structure.

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- Increase in GenAI use in Higher Education across all disciplines.
 - Transformative for teaching and learning, with potential to reshape assessment, feedback, and student support (Fitzgerald et al., 2025; Wang et al., 2025).
 - Not everyone on board (Sullivan et al., 2023): various barriers/objections (e.g. access, literacy, time, ethical, training, skills etc)
 - Not many systematic analyses of barriers to GenAI use across educational disciplines and professional services
 - Understanding the barriers helps identify contentious issues and can lead to better policies.

- Research on technology adoption often relies on individual-level models such as Technology Acceptance Model (TAM): perceived usefulness and ease of use (Davis, 1989; Venkatesh et al., 2003; Williams et al., 2015; Ghimire & Edwards, 2024).
- But empirical studies show that adoption is shaped by academic integrity, assessment alignment, institutional context, and norms (McGrath et al., 2023; Spathopoulou et al., 2025; Zhao et al., 2025)

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- Technology adoption and barriers cannot be explained by individual perceptions of usefulness and ease of use alone (Ayanwale, 2024; Shrivastava, 2025)
 - Generic adoption models poorly suited to complex settings: need for multi-level frameworks that integrate individual, institutional, and societal factors (FakhrHosseini et al., 2024).
 - There are clear differences across disciplines: adoption decisions reflect moral and institutional judgements rather than simple cost-benefit considerations (McGrath et al. 2023).

Our research objectives

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- Identify a wide range of GenAI use cases and barriers (individual, ethical, cultural, institutional)
 - Examine how barriers vary by discipline, comparing STEM and non-STEM fields (Yan & Qianjun, 2025).
 - Examine how barriers vary by role within the university, comparing academic and professional services staff.
 - Two separate methods: Literature mining and staff survey

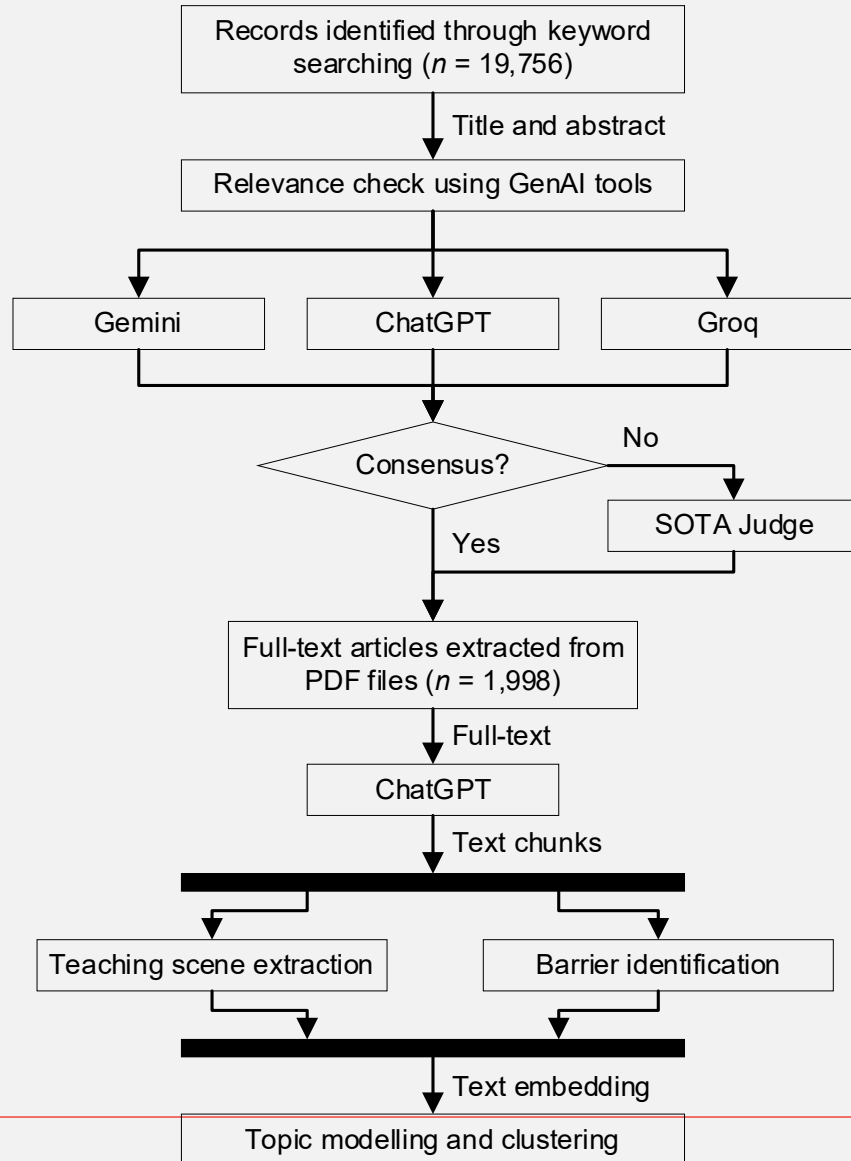


Literature Mining

Yang, J., K. Öge, H. V. Pham, C. Okorro and Y. Afejee (2026, submitted). "Identifying Barriers to Using Generative AI in Education Through AI-Assisted Large Scale Open Literature Mining." *Journal of University Teaching & Learning Practice*.



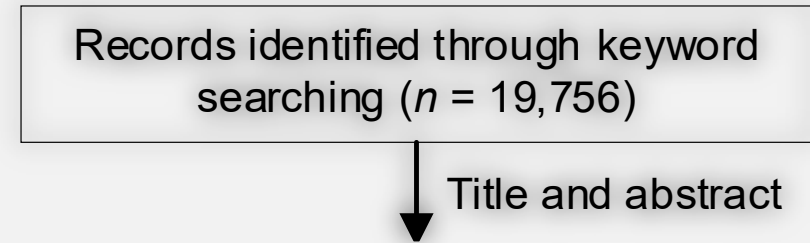
The Overall Workflow



1. Keyword search
2. Education-relevance screening
3. Full-text extraction
4. Learning and teaching scenarios & barrier extraction
5. Barrier clustering

Step 1: Keyword Search

Subject Area	Subject Keywords
Arts	American Studies, Ancient History, Architecture, Art History, Classical Languages, Classics, Comparative Literature, Composition, Creative Industries, Creative Writing, Critical Theory, Critical Thinking, Cultural History, Cultural Studies, Development Studies, Dramatic Arts, English Literature, Environmental Studies, Fashion Design, Film Studies, Fine Art, Geography, Global Studies, Graphic Design, History, Industrial Design, Interdisciplinary Humanities, Interdisciplinary Studies, Languages, Liberal Arts, Literature, Media Policy, Media Studies, Music Performance, Musicology, Performance Studies, Performing Arts, Poetry, Political History, Renaissance Studies, Social History, Sustainability, Theatre Studies, Translation, Visual Arts, Visual Culture
STEM	Agriculture, Animal Science, Applied Mathematics, Architecture, Artificial Intelligence, Astrophysics, Biochemistry, Bioinformatics, Biology, Biotechnology, Business and Technology, Chemistry, Civil Engineering , Climate Science, Cognitive Science, Computational Biology, Computer Science, Data Science, Dentistry, Ecology, Electrical Engineering , Engineering, Environmental Science, Geology, Geoscience, Innovation, Kinesiology, Landscape Architecture, Manufacturing, Materials Science, Mathematical Modelling, Mathematics, Mechanical Engineering , Medical Education, Medicine, Meteorology, Midwifery, Neuroscience, Nursing, Occupational Therapy, Oceanography, Optometry, Pharmacy, Physics, Physiotherapy, Psychology, Public Health, Software Engineering, Sports Science, Statistics, Systems Biology, Theoretical Physics, Urban Planning, Veterinary Medicine
Social Sciences	Academic Skills, Adult Education, Applied Linguistics, Business, Continuing Education, Cultural Studies, Curriculum Studies, Development Economics, Developmental Psychology, Digital Humanities, Disability Studies, Doctoral Training, Economics, Education, Education and Employment, Ethics, Finance, Foundation Education, Healthcare, Human Rights, Interdisciplinary Studies, International Relations, Labour Market Studies, Language Education, Law, Legal Studies, Management, Marketing, Pedagogy, Philosophy, Physical Education, Political Philosophy, Political Theory, Politics, Preparation for Higher Education, Professional Development, Quantitative Methods, Religious Studies, Research Methods, Social Policy, Social Science Research, Sociology, TESOL, Teacher Training, Theology, Workplace Learning, Workplace Research



- AI AND (education OR teaching OR learning) AND [subject]
- Each article is labelled with a subject.



An open-access repository of electronic preprints.

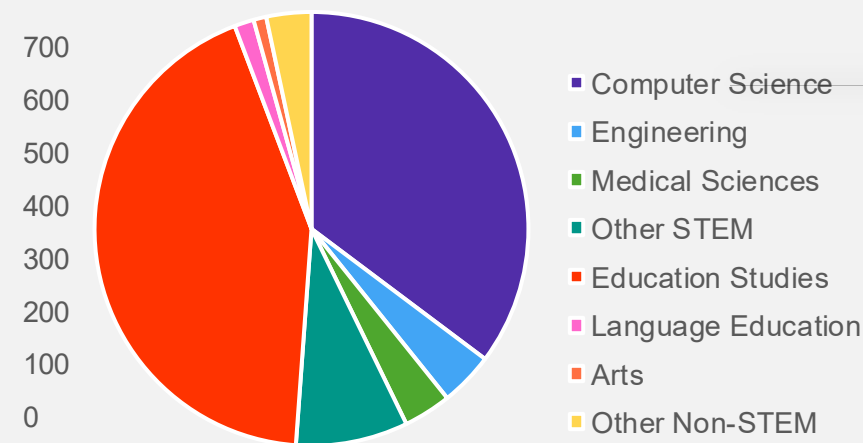
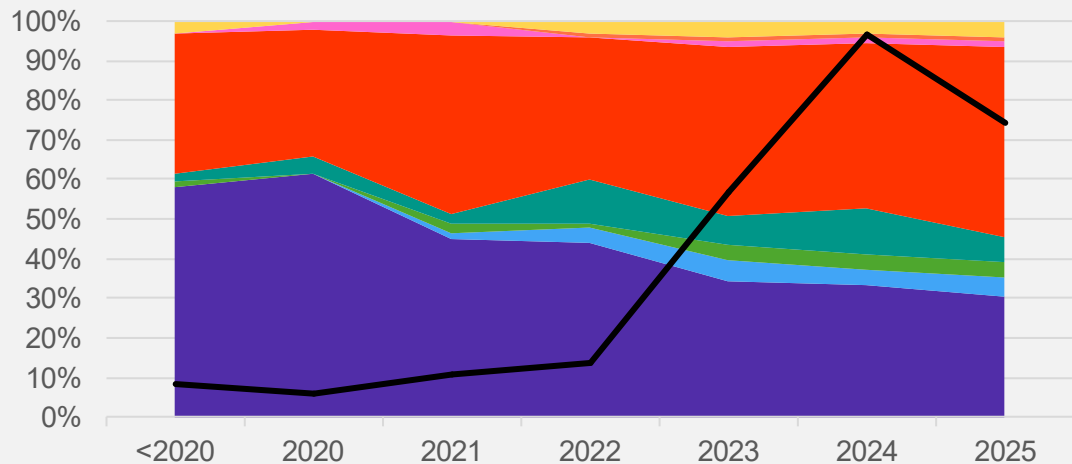
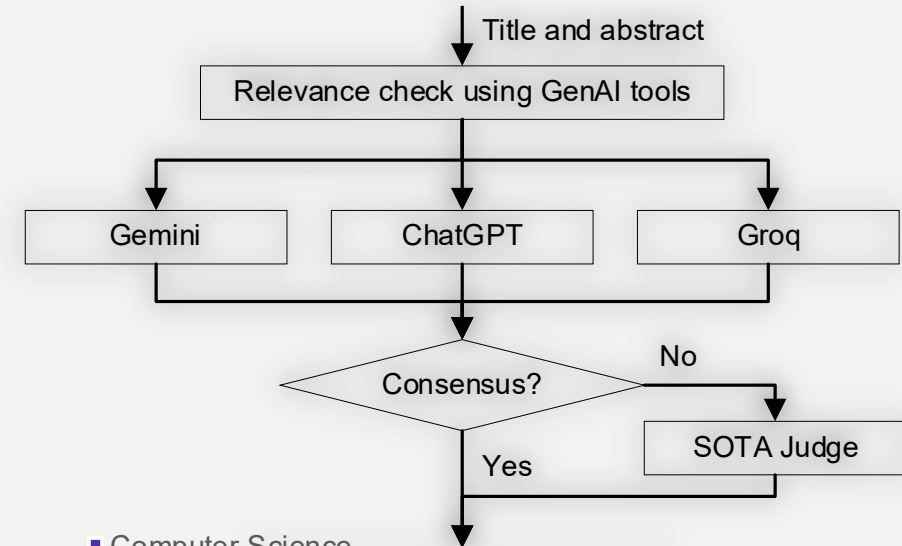
Step 2: Education-Relevance Screening

Parallel LLM Screening

- ChatGPT-4o mini | Gemini 2.0 | Llama3-70B
- Relevance Scoring (0-1)

The SOTA (state-of-the-art) Judge

- GPT-4o resolves disagreements

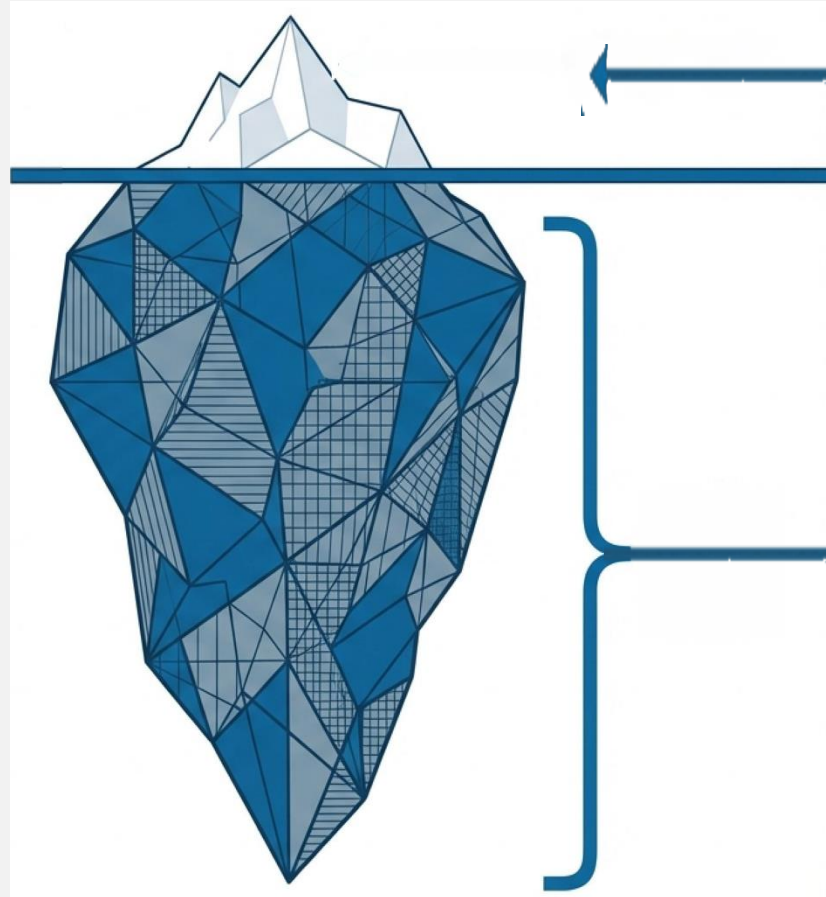


JY

- Computer Science
- Engineering
- Medical Sciences
- Other STEM
- Education Studies
- Language Education
- Arts
- Other Non-STEM
- Total

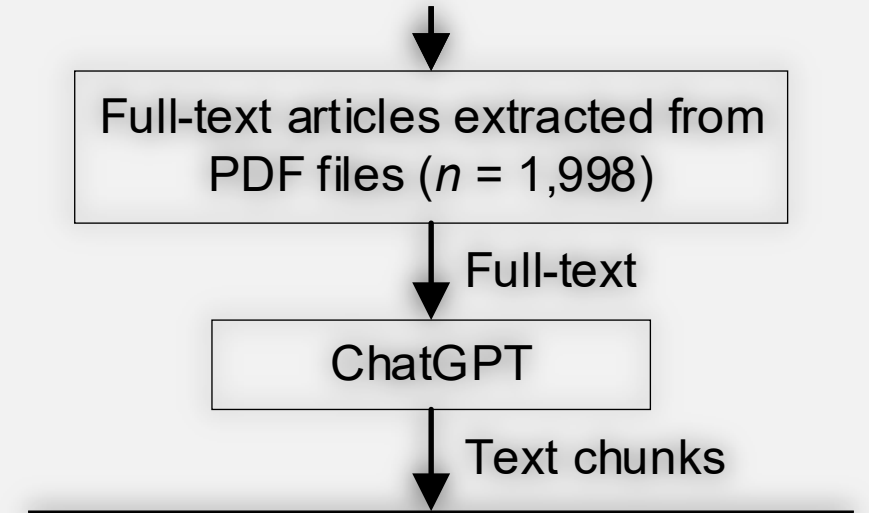
Adoption is happening everywhere. The divide isn't about **who** is trying it, but **how** they are struggling. (H1)

Step 3: Full-text Extraction



~2000
full-text articles

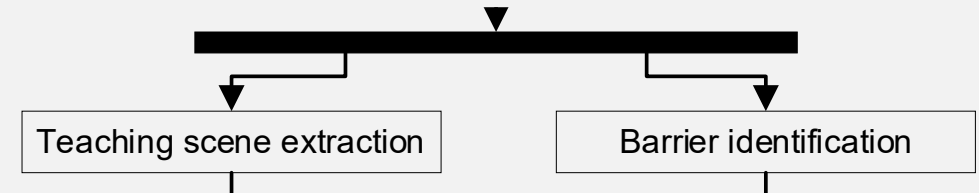
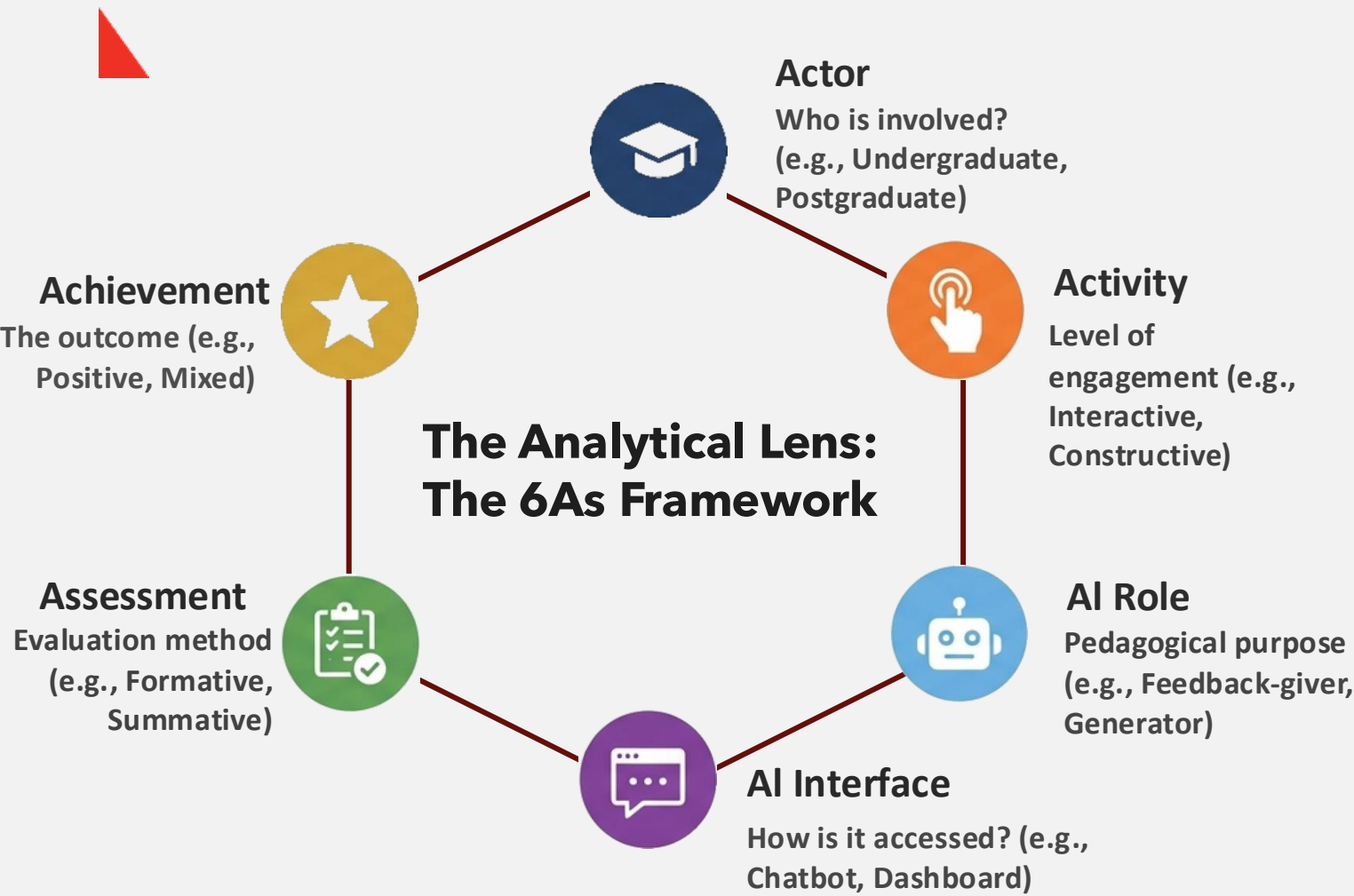
19,000+
scanned records



OpenAI: "As of March 1, 2023, data sent to the OpenAI API is not used to train or improve OpenAI models"

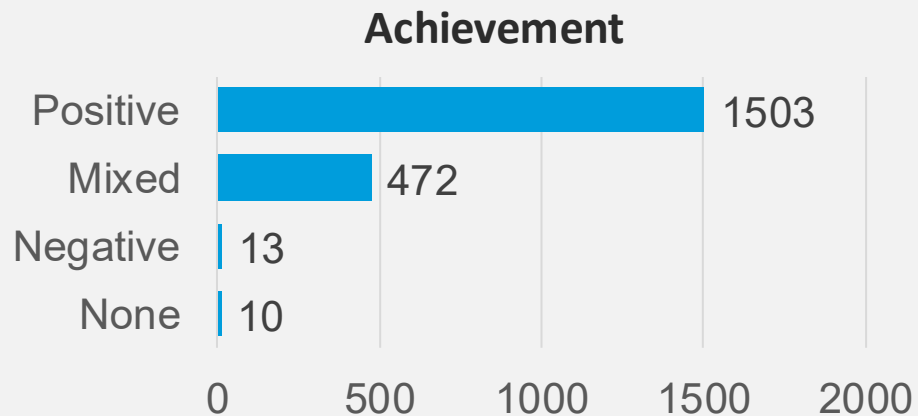
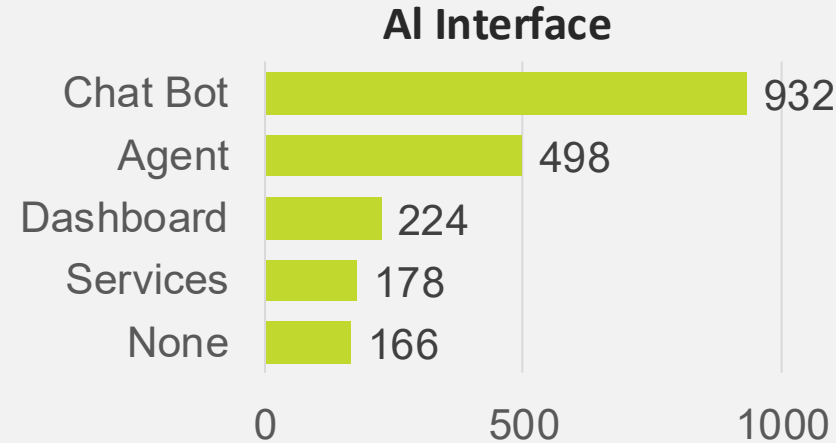
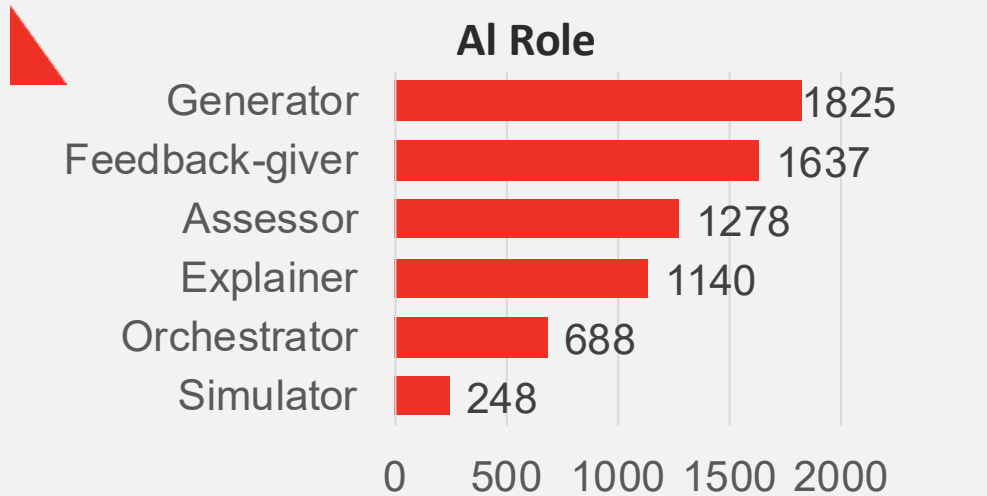
Creative Commons (CC 4.0) "This license allows reusers to distribute, remix, adapt, and build upon the material in any medium or format, so long as attribution is given to the creator."

Step 4 - Learning and Teaching Scenarios



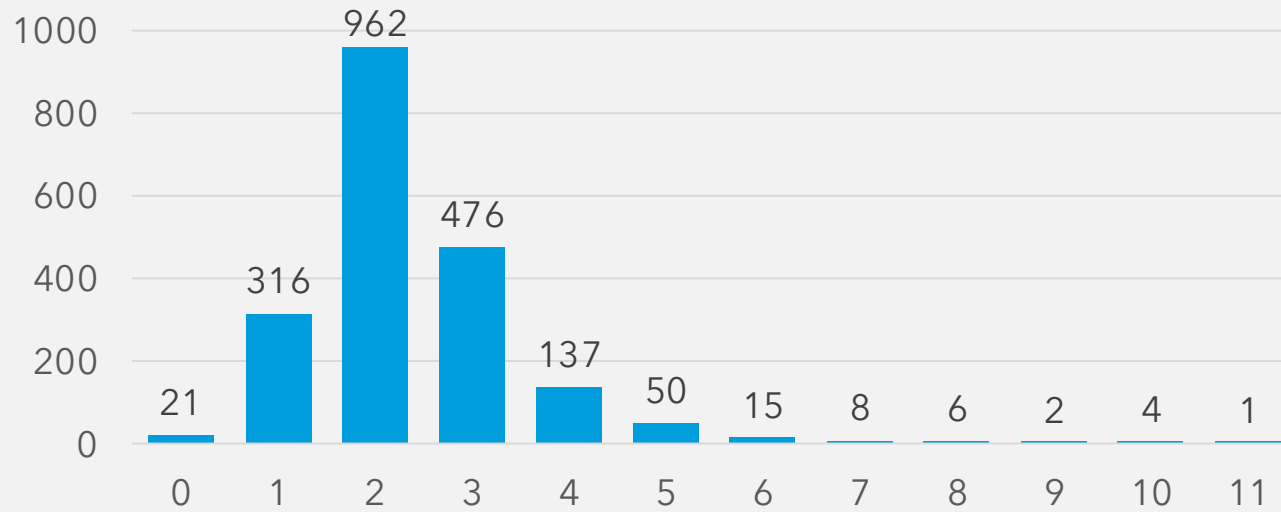
Article	Safilian et al. (2025)
Actor	UG/PG
AI Interface	Service
Activity	Constructive
AI Role	Assessor/Feedback-giver/Generator /Explainer/Orchestrator
Assessment	Summative
Achievement	Positive
Artefact	Automated grading of open-ended exam questions using rubric-based scoring and feedback generation;
URL	http://arxiv.org/pdf/2505.23818v1

Learning and Teaching Scenarios



1. Despite the hype of autonomous agents, the reality is still conversational.
2. **75% of extracted learning scenarios report positive student achievement. (H2)**
 - Negative outcomes are rare and isolated.
 - Failures are typically tied to specific experiments on 'AI detection' or bias validation.
 - Primary successes: Efficiency gains, personalized feedback, and learner support.

Step 5 - Barrier Extraction



- 4,729 barriers were extracted from 1,998 articles
- Although a few extreme cases occur, most reported use cases involve 1-3 barriers.

Barriers (Safilian et al., 2025)	Barrier Cluster
Data availability barrier Scarcity of labelled datasets for training and evaluating automated grading systems, especially for open-ended responses.	B6
Technical barrier Existing automated grading systems often lack adaptability across different subjects and grading criteria, requiring retraining for each new exam.	B10

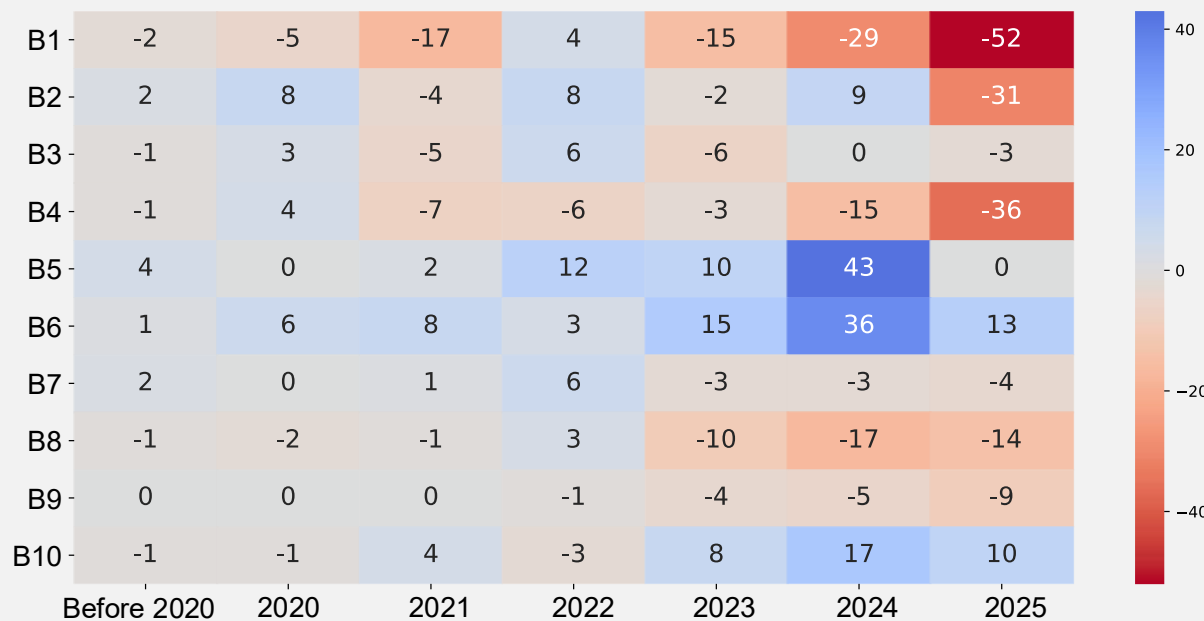
Step 6: Barrier Clustering

- Cluster texts are encoded using OpenAI text embedding models for clustering.


↓ Text embedding

Topic modelling and clustering

- Perceived barriers to GenAI adoption vary systematically across subject areas. (H3)**

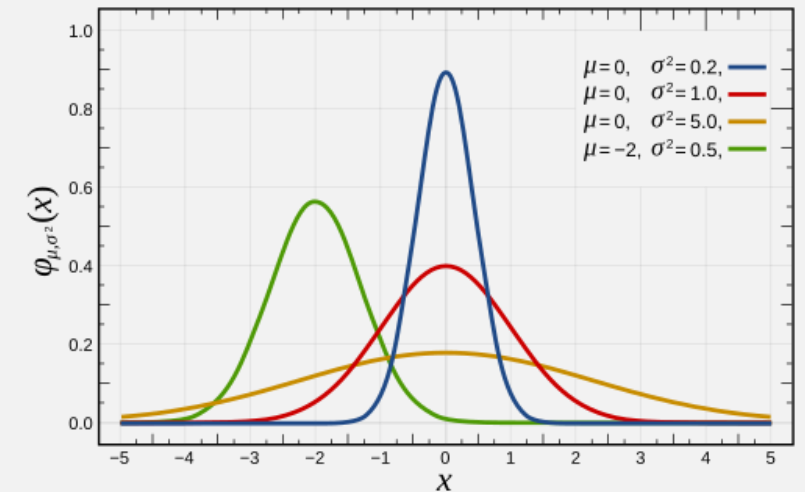


- STEM** fears inaccuracy (B5) and data availability (B6);
- Non-STEM** fears authorship, copyright (B1) & workflow misalignment (B4).

- 
- Traditional adoption models such as TAM overlook institutional and societal factors (FakhrHosseini et al., 2024)
 - In non-STEM subjects, GenAI adoption/barriers are shaped by concerns about authorship, academic integrity, assessment alignment, and policy clarity
 - In STEM subjects, adoption/barriers are more strongly driven by task performance factors such as accuracy and data availability
 - Overall, GenAI adoption depends on disciplinary context and institutional conditions, not just individual attitudes (Ghimire & Edwards, 2024)

Staff Survey

Yang, J., K. Öge, A. v. Mühlénen, A. B. Akbulut, T. S. Carey and C. Okorro (2026, submitted). "Multi-Level Barriers to Generative AI Adoption Across Disciplines and Professional Roles in Higher Education." Education Sciences.

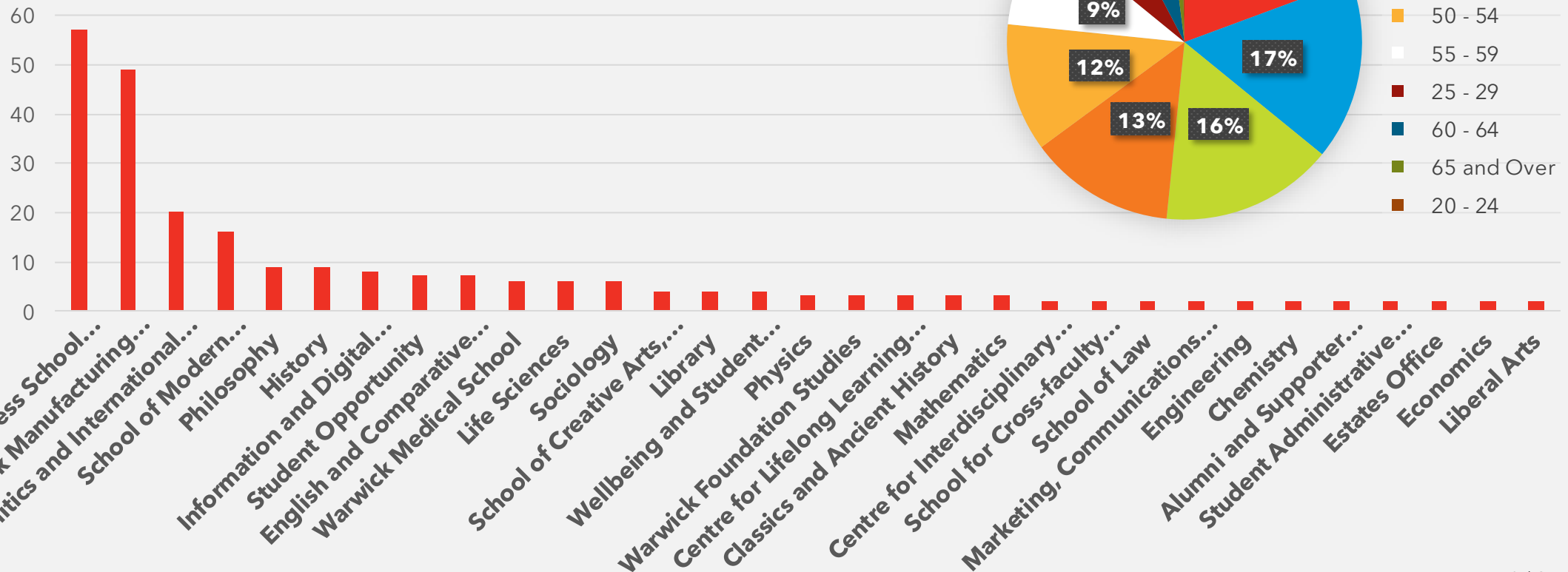


Demographics

Survey Period: 16 June - 25 July 2025 (N=273)

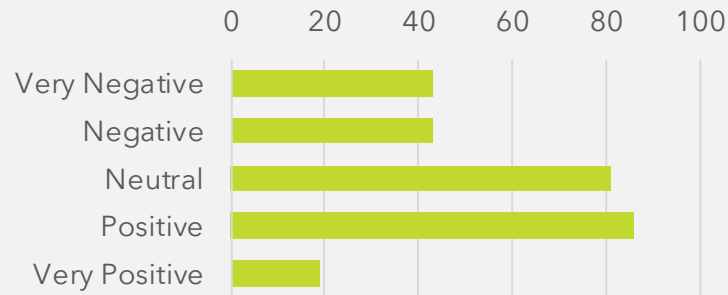
Female	152
Male	97

Academic	148
Professional Services	124

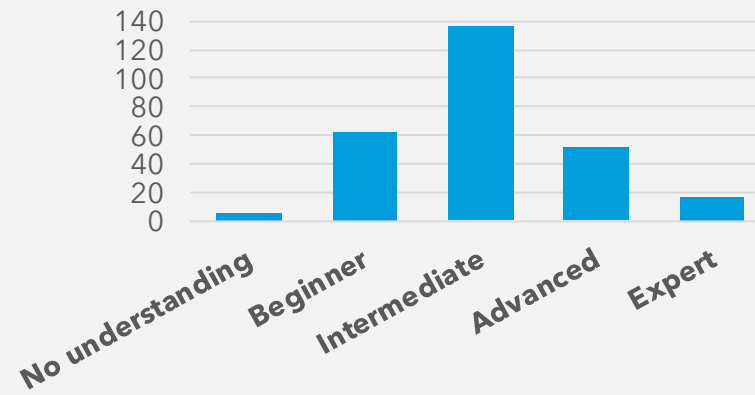




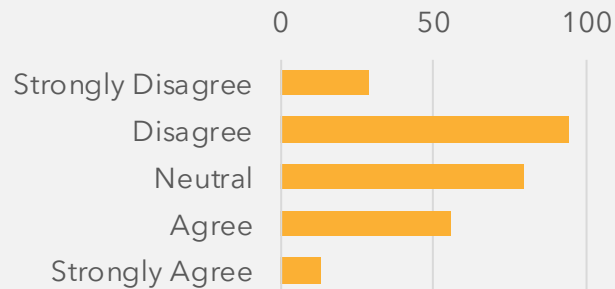
Overall View of GenAI in Education (Q3.1)



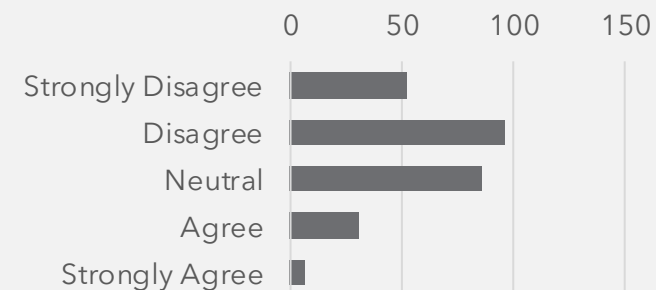
Self-Reported Literacy Levels (Q1.1)



Clear Guidance (Q4.1)



Sufficient Support (Q4.2)

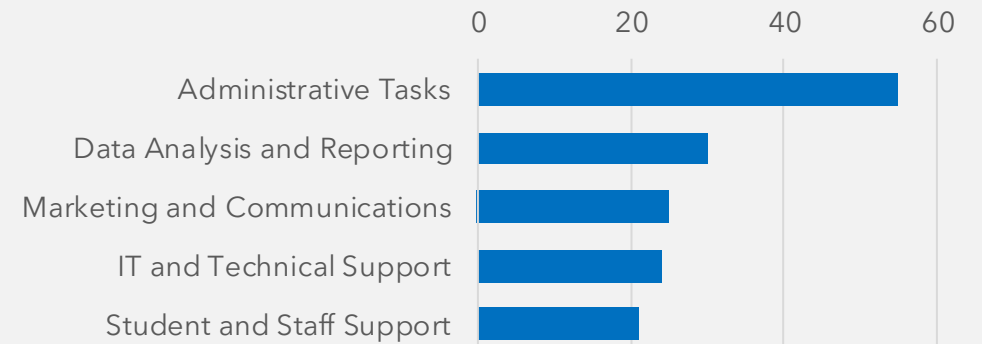




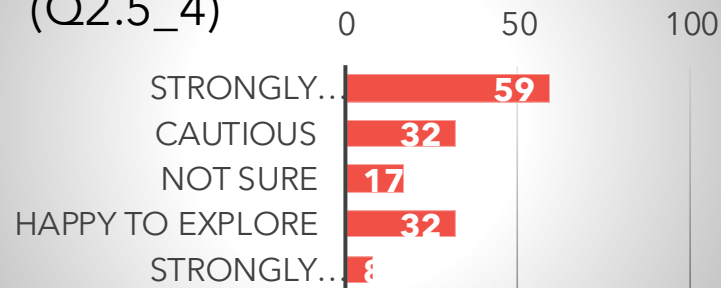
Teaching Use Cases (Q2.3)



Professional Service Use Cases (Q6.2)

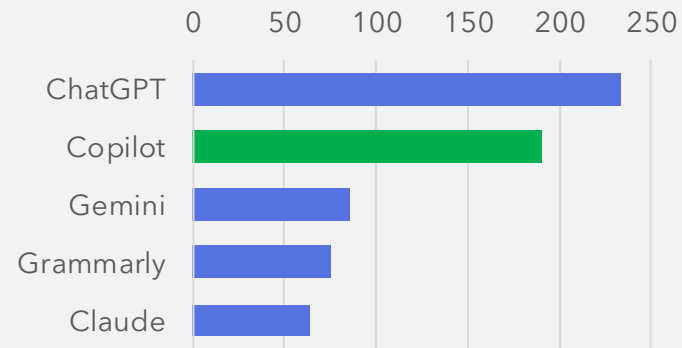


Automated Marking (Q2.5_4)





Tool Usage (Q1.2)



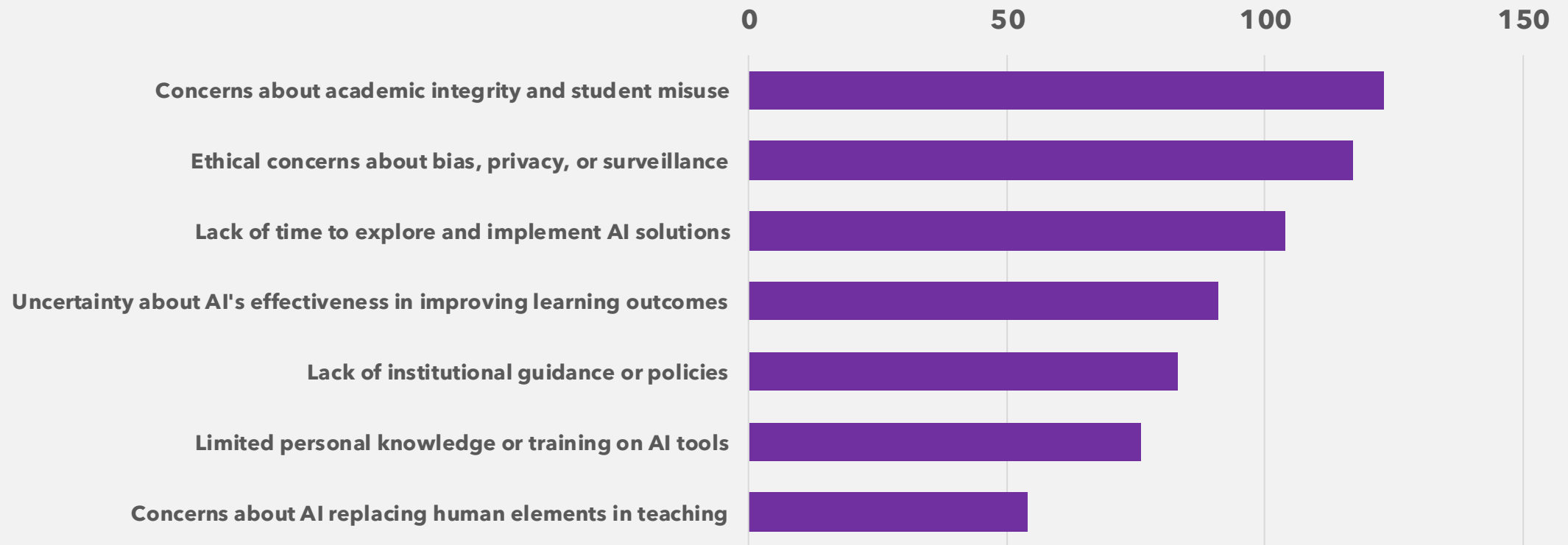
Preference vs policy

***“The uni provides copilot only.
This is like being in the stone age
of AI.”***

***“Guidance and policies are
reactive and not keeping up ...”***

...

What are the main barriers to using GenAI (pick 3, Q2.6)



The Discipline/Role Divide (the “What”)

What are the main barriers to using GenAI in your teaching/work? (pick 3, Q2.6)

Lack of institutional **guidance or policies** (Ins);
Concerns about academic **integrity** and student misuse (E);
Limited personal **knowledge** or training on AI tools (Ind);
Lack of **time** to explore and implement AI solutions (Ind);
Ethical concerns about **bias, privacy**, or surveillance (E);
Uncertainty about AI’s effectiveness in improving learning outcomes (Ind);
Technical difficulties or lack of institutional **support** (Ins);
Concerns about AI **replacing human** elements in teaching (E);
Resistance from colleagues or institutional culture (C);
Lack of funding or **access** to appropriate AI tools (Ins);
Preference for traditional teaching methods (C);

The Discipline/Role Divide (the “What”)

Which categories of barriers are more dominant in the survey?



Which barrier categories did STEM v non-STEM staff pick?

Which barriers categories did teaching v professional staff pick?

In absolute terms, ethical barriers have been chosen as the most important ones for both STEM and non-STEM teaching staff.

Although relatively ethical concerns are much more dominant among non-STEM teaching staff.

Professional Services highlight individual barriers the most - less emphasis on ethical barriers.

STEM (reference) vs Non-STEM

Does being from STEM predict a certain barrier category?

Outcome Category	B	OR = Exp(B)	p	Notes
Ethical	-0.545	0.58	0.181	Not significant
Individual	-0.857	0.424	0.035	non-STEM lower odds than STEM
Institutional	-0.952	0.386	0.024	non-STEM lower odds than STEM

- Compared to non-STEM staff, STEM staff face higher institutional (more than 2 times) and individual (almost 3 times) barriers.

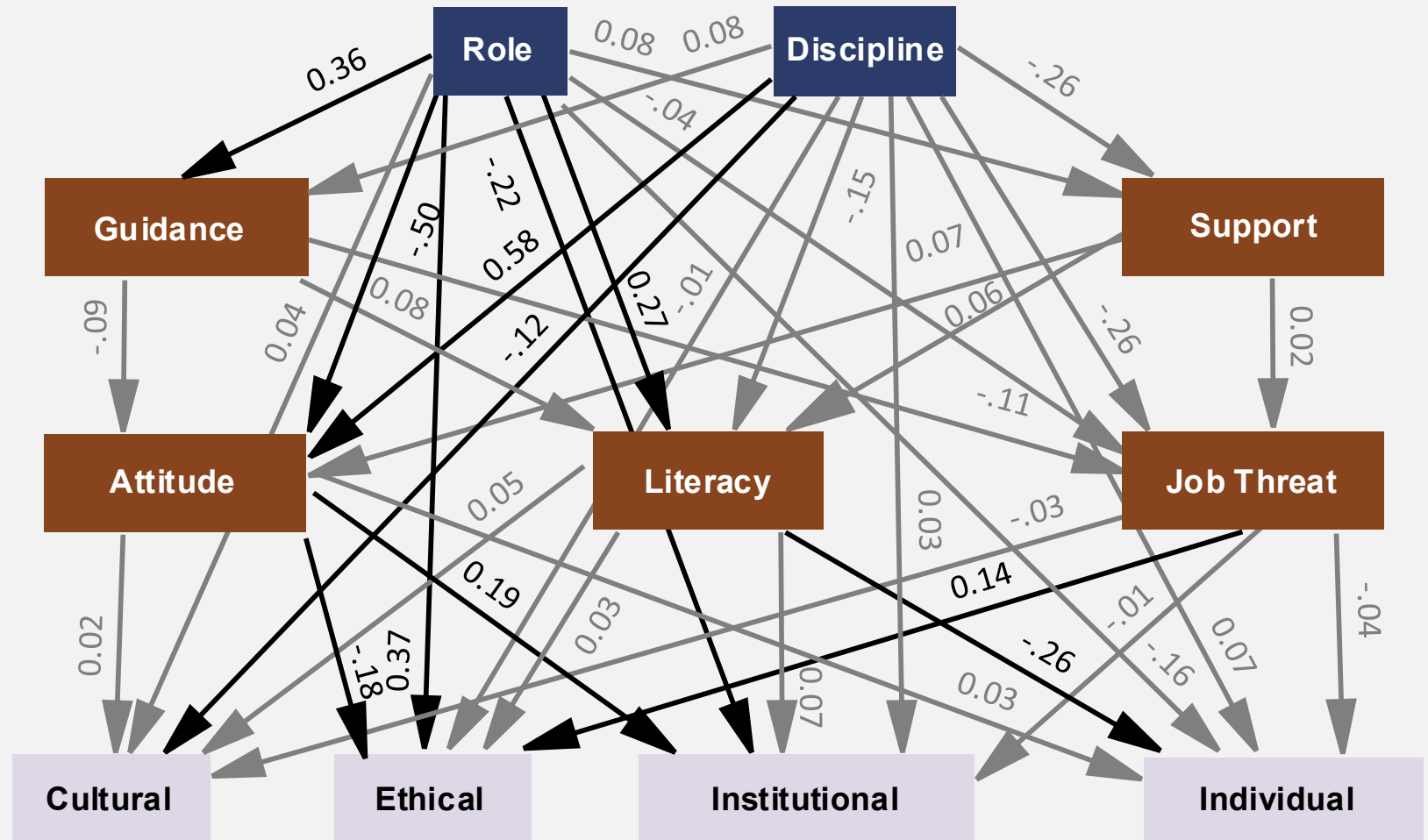
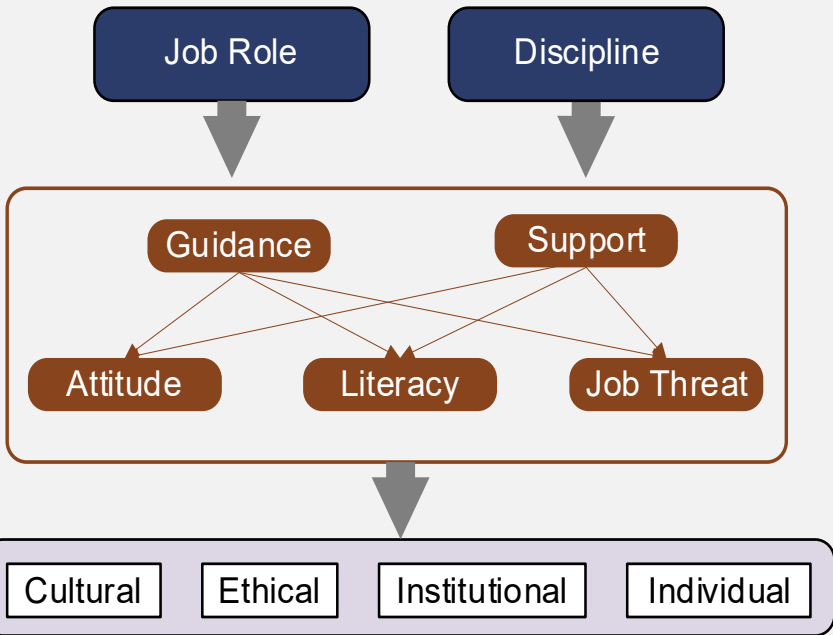
Teaching (reference) vs Non-Teaching

Does working in professional services predict a certain barrier category?

Outcome category	B	OR = Exp(B)	p	Notes
Ethical	-0.196	0.822	0.522	Not significant
Individual	0.502	1.653	0.101	Not significant
Institutional	0.788	2.198	0.016	Non-teaching higher odds than teaching

- Professional Services staff are over 2 times more likely to report Institutional Barriers than teaching staff.

Structure Equation Modelling (the "How")



- Guidance/support are not (yet) significantly associate with attitude/literacy/job threat.
- Staff most eager to use GenAI are associated with institutional barriers (Attitude → Institutional).
- Literacy reduces individual barriers.


Text Clustering (the “Why”)

Use case cluster from free-text entries

ID	Size	Description	Representative Phrases
C1	22	Teaching AI literacy and critique	'Use AI to improve student prompting', 'Students critique AI-generated solutions', 'Sessions on ethical use and hallucinations', 'AI as co-pilot in the design process', 'Instant, individualized feedback for students'
C2	14	Communications and Document Support	'Drafting emails and newsletters', 'Summarising publications and meeting transcripts', 'Improving LinkedIn and social copy', 'Creating marketing and workshop content', 'Excel formulas and basic data analysis'
C3	11	Email & communication editing	'Restructuring an email to sound more professional', 'Rewrite email to sound more professional and compassionate', 'Re-drafting emails for professional tone and brevity', 'Toning down an email', 'Producing minutes/meeting summary'
C4	11	Teaching Materials Creation	'creating teaching materials', 'creating assessments', 'creating images and infographics', 'creating multiple choice quizzes', 're-thinking established materials', 'creating workshop tasks'
C5	9	AI as Teaching Assistant	'practice client for students', 'generate quick MCQs for engagement', 'turns ChatGPT into a simulator', 'generate examples from different cultures', 'ask students to criticize the answer', 'ChatGPT playing as industry expert'
C6	9	Automation, code and communications	'Create Power Automate workflows', 'Draft emails and communications', 'Write Excel macros and Python scripts', 'Troubleshoot PowerApps/Power BI issues', 'Review and soften email templates'
C7	9	Content drafting, summarisation and media	'Summarise research literature', 'Summarise emails', 'Create presentation/workshop structure', 'Assist with code development', 'Generate videos using avatars', 'Produce case studies and examples'
C8	8	Research, summarisation and automation	'Summarise reports and financial data', 'Research resources and analyse reports quickly', 'Generate Excel or PowerAutomate code', 'Search internal webpages or policies', 'Draft and reformat structured reports'
C9	8	Email and Writing Assistance	'make emails more empathetic', 'check grammar and style', 'tone down email wording', 'draft professional client responses', 'ensure writing reads natural for non-native speakers', 'take minutes and write letters'
C10	7	Teaching session design	'Generate outline for teaching session', 'Design role-play scenarios and characters', 'Create rubrics, LOs and feedback', 'Generate multiple-choice questions to test students', 'Convert session brief into presentation and Q&A'

Barrier cluster from free-text entries

ID	Size	Description	Representative Phrases
B1	21	Opposed to GenAI integration	'I will not be integrating GenAI into my teaching', 'I do not intend to integrate GenAI', 'I am strongly against the integration of GenAI', 'No, I don't plan to integrate AI into my teaching', 'I have no desire to embed genAI and support a ban'
B2	20	Copilot-Only Policy Frustration	'Copilot is the only authorised tool', 'Copilot is inferior to ChatGPT/Claude', 'No approval for competitor products', 'Shifting guidance on data uploads', 'Poor quality and hallucinations'
B3	15	Erodes learning and integrity	'Undermines critical thinking and writing', 'Students bypass skills for instant gratification', 'Makes cheating hard to detect; devalues degrees', 'Produces superficially competent but inaccurate work', 'Shortcuts before learning underlying skills'
B4	14	Eroding critical thinking	'Students becoming too reliant on GenAI', 'GenAI obliterating students' critical-thinking skills', 'Students skip work trusting AI', 'Overreliance on prompting instead of thinking', 'GenAI spreading misinformation as fact'
B5	13	Factual Accuracy & Reliability	'AI isn't always correct!', 'When AI gets it wrong.', 'factual accuracy in finance', 'still checking the work', 'misinterpreted core message'
B6	11	Accuracy and Trust Concerns	'Some staff are mistrustful of it.', 'Not being accurate, so always have to check over what the output is.', 'It is not personal, and content may end up all sounding the same.', 'I don't trust it to be either ethical or good enough quality.', 'Whether the information delivered is factual.'
B7	11	Institutional access and support barriers	'No access to latest AI tools-subscriptions required', 'University won't provide licenses or premium versions', 'Policies make tool approval time-consuming', 'Lack of funding or licensing for AI tools', 'Departmental reluctance and low institutional uptake'
B8	9	Skill erosion and assessment validity	'Undermines critical thinking', 'Students over-rely on AI', 'Written essays become invalid', 'Homogenized writing styles', 'AI-generated factual errors'
B9	9	Concerns about AI use	'AI encourages shortcut assignments', 'Leads to shallow engagement with tasks', 'Students distrust teachers using AI', 'Teacher dependence may reduce attendance', 'Variability, cost and access issues', 'Students resent AI-driven grading'
B10	9	Unclear policy and guidance	'Unclear whether university policy allows it', 'No clear guidance on GDPR and confidentiality', 'Don't know who to consult (IDG/legal)', 'Avoid using it due to policy uncertainty', 'Difficulty finding policies on university website'

- 
- Diversity of opinions on GenAI, barriers, and support.
 - Concerns among ethical issues dominate – confirming our approach to multi-level barriers.
 - Other highly mentioned barriers include time, pedagogical uncertainty, institutional support, and personal skills.
 - Staff demands clearer guidance and support in AI use.
 - The requirement to use Co-pilot is particularly seen problematic.
 - Literacy significantly reduces individual barriers
 - Staff who are most engaged with GenAI are often those most aware of institutional gaps.



Significant difference in barriers between STEM v non-STEM.


- Non-STEM reported more ethical and cultural barriers
- STEM staff more likely to face higher institutional & individual barriers

Significant difference in barriers between academic v professional services.

- Professional services reported more individual barriers.
- Professional services more likely to face institutional barriers.



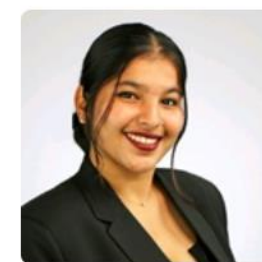
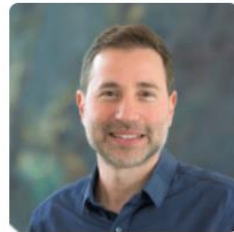
Potential Actions

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- Policy Recommendations:
 - Invest in GenAI literacy using a broader range of tools
 - Prioritise institutional clarity and support
 - Avoid one-size fits all approach:
 - Design discipline-specific adoption strategies
 - Design role-specific adoption strategies.
 - Governance structure
 - The level of complexity and profound impact calls for a more effective governance structure.
 - Adaptive governance (flexible, evidence-driven, inclusive), that evolves with the technology

Acknowledgements



- 16 Staff + Students
- 9 Departments



A photograph of three people sitting on a brick wall. On the left, a man with glasses is partially visible, looking towards the women. In the center, a woman with long dark hair, wearing a light pink shirt and blue jeans, is smiling and looking towards the man. On the right, another woman with long dark hair, wearing a white shirt and a light-colored skirt, is looking towards the man. The background is a textured brick wall.

**Do you
have any
questions?**

Thank you.

WMG

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