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# Assurance of learning in the age of AI: A sector scan and future-focused call to action

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As Artificial Intelligence (AI) continues to evolve and influence higher education, ensuring that Assurance of Learning (AoL) frameworks remain both robust and adaptable, is vital. This paper presents a qualitative document analysis of Australian university AoL frameworks, examining their readiness for AI integration. The findings reveal a sector in early adaptation, marked by a tension between foundational AoL principles and Al's disruptive pace. We observe strategic Al acknowledgement often confined to policy, a nascent reform of graduate attributes to encompass AI literacy, and innovative practices largely isolated at the course or program level. Consequently, core AoL components such as curriculum mapping and assessment design, often remain disconnected from Al-assisted learning, limiting their reliability. This highlights significant conceptual and operational gaps, including varied institutional maturity, fragmented approaches, and a lack of sector-wide consensus or explicit guidance on ethical, observable Alenhanced assessment. This paper calls for a shift from static quality assurance, defined by periodic compliance checks, to dynamic and systems-aware learning assurance. It proposes a future-focused AoL approach that embeds AI literacy, inclusive assessment design and stronger sector collaboration. As the first in a series, it contributes to ASCILITE 2025 by exploring how human expertise and AI can uphold academic standards.

*Keywords:* Assurance of learning, artificial intelligence, institutional readiness, curriculum mapping, assessment design, sector benchmarking, qualitative document analysis.

#### Introduction

Assurance of Learning (AoL) provides a vital mechanism for higher education institutions to evaluate whether students are achieving intended learning outcomes and graduate capabilities (Peregrine Pathways, 2024; Do & Smith, 2022). Globally, accreditation bodies such as Association to Advance Collegiate Schools of Business (AACSB) and regulatory agencies including Quality Assurance Agency for Higher Education (QAA), emphasise AoL as a cornerstone of academic integrity, student success, and institutional accountability (AACSB International, n.d.; AACSB International, 2020; Fagnot, 2023; QAA, 2018; QAA, 2024). In Australia, the Higher Education Standards Framework (HESF) sets out clear expectations for AoL within quality assurance systems (Tertiary Education Quality and Standards Agency (TEQSA), 2021). AoL is fundamental to ensuring educational quality and maintaining the credibility of academic qualifications. It refers to a structured, cyclical process by which higher education institutions define, measure, evaluate, and enhance student learning outcomes at the course, program, and institutional levels. At its core, AoL ensures alignment between what is taught, how it is taught, how student learning is assessed, and what graduates are expected to know and do upon completion of their studies, in ways that reflect not only academic standards but also evolving industry needs and professional competencies (Lawson et al., 2015b).

#### AoL processes typically include:

- Development of learning outcomes aligned with graduate attributes, disciplinary standards, and
  accreditation requirements. These are increasingly shaped by input from industry advisory panels and
  accrediting bodies to ensure relevance, employability, and sectoral alignment (Rowe & Winchester-Seeto,
  2021; Oraison et al., 2019; Krause et al., 2014; Hammer et al., 2020).
- Assessment design that ensures valid, reliable, and authentic measurement of these outcomes, with strong alignment to teaching strategies and graduate capabilities (Boud & Falchikov, 2007; Crisp, 2012; Krause et al., 2014; Ugray & Dunn, 2022).

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- Systematic collection and analysis of performance data, including direct assessments, rubrics, and learning analytics, to evaluate outcome achievement and identify areas for improvement (Bennett et al., 2017; Carless, 2007; Calma, 2023).
- Continuous improvement informed by data and stakeholder feedback (students, graduates, employers), allowing curriculum, pedagogy, and academic support to evolve in line with changing professional and societal needs (Adeinat et al., 2022; Steinhardt et al., 2017;).

AoL plays a critical role in ensuring that students achieve meaningful and measurable learning outcomes by driving continuous improvement in curriculum design, teaching practices, and assessment. While it contributes to institutional accountability, compliance, and strategic planning, its primary role lies in enhancing student learning and aligning graduate capabilities with industry and societal needs (Steinhardt et al., 2017; Tham et al., 2023). AoL also contributes to broader societal goals by ensuring programs remain relevant to evolving workforce and community expectations. This alignment enables institutions to determine whether graduates are equipped with the skills, knowledge, praxis and dispositions to succeed in a dynamic, Al-influenced world of work (TEQSA, 2024; Tham et al., 2023).

Furthermore, effective AoL systems bring together diverse voices, including academic staff, students, employers, industry partners, professional associations, and accrediting agencies. By drawing on these perspectives, institutions can shape curriculum quality and program delivery in ways that are both rigorous and responsive. This collaborative approach strengthens quality assurance, advances student development, and ensures graduate readiness by acting as a critical bridge between higher education and evolving workforce needs.

Yet with the rapid integration of AI into learning and assessment, traditional AoL systems face growing limitations. AI tools now support everything from automated feedback and intelligent tutoring to adaptive content creation, raising new opportunities and challenges for assessment validity, academic integrity, and equitable learning outcomes (AI Taskforce, 2023; Zawacki-Richter et al., 2019). AoL frameworks developed for pre-AI contexts risk becoming outdated unless adapted to assess not only disciplinary knowledge but also AI literacy, critical thinking, and real-world capabilities (Lloyd et al., 2024). These concerns are echoed by industry and policy stakeholders, who caution that graduates may require significant upskilling if tertiary programs fail to keep pace with the rapid and accelerating evolution of AI, a challenge explicitly highlighted by industry and regulatory bodies alike (Jobs and Skills Australia (JSA), 2025; TEQSA, 2023a; TEQSA, 2024). This reinforces the need for AoL to extend beyond compliance and credentialing, playing a transformative role in assuring graduate readiness for the demands of AI-driven work and society.

This paper argues that AoL must evolve from a static, compliance-based model characterised by periodic checks that emphasise documented processes and formal accountability, to a dynamic, systems-aware approach aligned with the realities of Al-enhanced education. It calls for reimagined AoL frameworks that embed Al literacy, inclusive and authentic assessment practices, and sector-wide collaboration. Drawing on a comprehensive literature and policy review, the paper explores how Australian universities are responding to these challenges, mapping innovations, exposing persistent blind spots, and identifying opportunities for strategic redesign. It proposes a future-focused agenda for AoL that ensures graduates are not only academically proficient but also ethically, digitally, and professionally prepared to thrive in an Al-rich landscape.

#### Aims and methodology

This review adopts a systems-thinking and anticipatory lens to examine how AoL frameworks are evolving in response to Al in higher education. It positions AoL as a dynamic, future-focused mechanism aligning curriculum, assessment, and graduate capabilities with fast-changing workforce and technological demands (Kezar, 2011; Mabin & Marshall, 2020; Mantai & Calma, 2022).

A qualitative document analysis was conducted, drawing on two key data sources:

 Publicly available university documents: AoL-related policies, curriculum mapping tools, strategic plans, accreditation submissions, and student-facing web content were collected from 15 Australian universities, namely: Australian Catholic University (ACU), Bond University (Bond), Central Queensland University

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(CQUniversity), Deakin University (Deakin), Edith Cowan University (ECU), Flinders University (Flinders), Griffith University, Royal Melbourne Institute of Technology University (RMIT), Swinburne University of Technology (Swinburne), University of Adelaide, University of Newcastle (Newcastle), University of South Australia (UniSA), University of Sydney, University of Technology Sydney (UTS), and University of the Sunshine Coast (UniSC). Institutions were selected to reflect metropolitan, regional, and dual-sector representation, including different TEQSA classification bands. The inclusion of both UniSA and the University of Adelaide was driven by their strong AoL focus and the unique context of their ongoing merger, providing a timely case study of how large-scale institutional change can embed consistent, Alinformed graduate attributes and AoL practices.

National and international frameworks: Analysis also drew on TEQSA's Higher Education Standards
Framework (HESF), the Australian Qualifications Framework (AQF), and global assurance bodies such as
AACSB, the European Foundation for Management Development (EFMD) / European Quality
Improvement System (EQUIS), and the United Kingdom's QAA. Sectoral perspectives included guidance
from the Council of Australasian University Leaders in Learning and Teaching (CAULLT), the Australasian
Council on Open, Distance and e-Learning (ACODE), and recent publications by TEQSA, including the
National Academic Integrity Network (NAIN) and the Generative AI Considerations for Higher Education
Providers.

**Document Selection and Sampling Strategy:** Documents were purposively sampled from institutional websites and public databases using terms such as "Assurance of Learning," "graduate attributes," "curriculum mapping," "assessment policy," "Al in learning," and "academic integrity." The most recent versions were prioritised. Inclusion was based on relevance to AoL processes, Al framing, or graduate capabilities. **Data Analysis:** A combined deductive—inductive thematic analysis was conducted, guided by systems thinking and anticipatory governance. Coding categories were based on the research questions and TEQSA's HESF domains. Documents were analysed in a qualitative matrix through three iterative coding cycles: (1) descriptive coding to capture references to Al, AoL, graduate capabilities, and assessment innovation; (2) pattern coding to identify trends and operational gaps; and (3) thematic clustering to develop discussion themes. Cross-institutional comparisons and alignment with national and global standards ensured triangulation. Divergent examples were retained to highlight institutional variation and strengthen transparency.

**Ethical Considerations:** As only public documents were used, formal Human Research Ethics Committee (HREC) approval was not required. Ethical research practice was ensured through transparency in data sourcing, fidelity to original content, and appropriate attribution. Anonymity was preserved for sensitive examples unless public attribution (e.g., named frameworks or Al tools).

The analysis addressed three research questions:

- 1. How are current AoL frameworks responding to the integration of AI in learning and assessment?
- 2. What conceptual and operational gaps are emerging within existing AoL practices?
- 3. What principles and practices can inform a reimagined, future-focused approach to AoL in Al-rich environments?

#### Key findings and discussion

This section presents the results from the qualitative document analysis, examining how AoL frameworks are responding to AI integration. It addresses the conceptual and operational gaps identified and proposes future-oriented approaches to guide reform. The analysis draws from publicly available AoL-related policies, strategies, curriculum tools, and student-facing communication, framed by national and international standards and relevant scholarly literature.

#### Current responses to Al integration: a tentative adaptation

Our findings reveal a sector at an emerging stage of adaptation, defined here as the process by which institutions incrementally adjust policies, practices, and frameworks to respond to the disruptive influence of AI on Assurance of Learning (AoL). At this stage, adaptation reflects early, often tentative shifts rather than comprehensive, embedded change. It is characterised by a tension between the foundational principles of AoL and the disruptive pace of AI evolution. Across the reviewed institutions, responses to AI integration within AoL frameworks remain cautious, uneven, and largely peripheral. Three key patterns emerged:

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- Strategic acknowledgement but limited AoL embedding: Many universities strategically acknowledge AI within academic integrity statements, strategic teaching frameworks, or broader policy updates. For instance, institutions like the University of Sydney, Griffith University, RMIT, and UTS have updated guidelines emphasising responsible and ethical AI use. The University of Sydney's two-lane assessment model comprising secure assessments (supervised, Al-restricted) and open assessments (where Al use is permitted with transparency) balances academic integrity with real-world digital literacy, helping students build responsible AI capabilities while preserving assessment integrity (Bridgeman, & Liu, 2025). At UTS, the Al-powered CILObot tool supports efficient drafting and refinement of Course Intended Learning Outcomes (CILOs), enhancing curriculum alignment (UTS, n.d.d). However, these acknowledgements often remain at a policy or guidance level without being systematically integrated into core AoL cycles such as program learning outcome (PLO) monitoring, curriculum mapping, or graduate attribute reporting. This is evidenced by a significant lack of faculty AI literacy and institutional support (Sustainability, n.d.), with fewer than 10% of universities having comprehensive AI policies (UNESCO, 2023; Media & Learning Association, 2023). The primary focus on academic integrity (RMIT University, n.d.a; Deakin University, n.d.a; n.d.b) rather than pedagogical integration, coupled with challenges in adapting traditional AoL frameworks (HEPI, 2025) and a limited systemic understanding of actual AI use (Universities Australia, 2024), hinders comprehensive AoL embedding. While these innovations exemplify forward-thinking approaches, their embedding into comprehensive AoL mechanisms requires significant structural change.
- Graduate attribute reform to include Al literacy: A critical first step towards acknowledging the evolving skill landscape is the move by several universities to embed digital fluency and Al-related reasoning into graduate attributes (Deakin University, n.d.c; Griffith University, n.d.; RMIT University, n.d.b, n.d.c; Swinburne University of Technology, n.d.a; UniSA, n.d.-b; University of Newcastle, n.d.a). Deakin's Graduate Learning Outcomes (GLOs) embed digital capabilities across disciplines (Oliver, 2015), and Swinburne's Future-Ready Learners model articulates future workforce needs. The University of Newcastle explicitly links Al use to life-readiness, while UniSA maps Enterprise Skills to Programme Learning Outcomes (PLOs). This aligns with broader national imperatives, as highlighted by Jobs and Skills Australia (JSA) in their Generative Artificial Intelligence Capacity Study (JSA, n.d.), which focuses on informing government strategy regarding Al's impact on the labour market and education and training systems. The International Labour Market Update (JSA, 2025) further underscores the growing demand for skilled workers in Science, Technology, Engineering, and Mathematics (STEM) fields and sectors like information and communication, which are heavily influenced by Al. These developments signal that AoL must extend beyond disciplinary knowledge to encompass Al literacy, critical thinking, and ethical Al use, supported by measurable indicators for robust implementation.
- Isolated innovation at course or program level: The prevalence of innovation being confined to pilot projects or capstone units indicates a lack of systemic integration. Isolated pilots such as ECU's initial adaptations to address AI within its academic integrity and assessment guidelines (ECU, n.d.), Bond's AI-integrated assessment practices (Bond University, n.d.b), the University of Sydney's oral assessments (Stevenson, Miller & Sitbon, 2025), and UniSC's scaffolded assessment linked to PLOs (UniSC, n.d.) highlight innovative but fragmented practice. While these initiatives are promising, their limited scale means they are not yet contributing to a comprehensive, institution-wide assurance of AI-informed graduate capabilities. This fragmentation hinders systemic impact, leading to missed opportunities for shared learning and inconsistent student experiences. The challenge lies in translating these isolated efforts into systemic changes that permeate all levels of AoL.

#### Conceptual and operational gaps: barriers to responsiveness

The review surfaced significant conceptual and operational gaps within existing AoL practices, that constrain institutional responsiveness to Al-driven change.

• Static AoL cycles misaligned with technological change: The reliance on static AoL cycles misaligned with technological change is a primary limitation. Static AOL cycles refer to rigid, time-bound processes for reviewing and assuring learning outcomes, typically tied to predetermined intervals such as accreditation or program review schedules. Universities including ACU (ACU, n.d.a), Flinders (Flinders University, n.d.a), Newcastle (University of Newcastle, n.d.b), UniSC (UniSC, n.d.b), and Swinburne (Swinburne University of Technology, n.d.a) operate on fixed AoL review cycles that do not keep pace with the rapid advancements and implications of AI. As highlighted by TEQSA's AI request for information: Provider action plans: key considerations (TEQSA, 2023b), institutions must develop adaptable action plans and ongoing review processes to mitigate AI risks and ensure the integrity of higher education awards. Traditional fixed-

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timeline reviews, often tied to accreditation cycles, are inherently ill-suited to the dynamic nature of AI, which necessitates agile updates to learning outcomes and assessment strategies. This structural inertia risks rendering AoL frameworks outdated before they can effectively respond to emerging AI challenges.

- Limited systems thinking and responsiveness: While many Australian universities are introducing Alrelated policies and ethical guidelines, few have explicitly embedded these considerations within their Assurance of Learning (AoL) frameworks. This reflects a gap noted in the literature (Lawson et al., 2015a), where broader socio-technical issues such as staff readiness, digital equity, and evolving discipline norms are often overlooked in formal learning assurance processes. Institutions such as the University of Technology Sydney (UTS, n.d.b), the University of Sydney (University of Sydney, 2024), Griffith University (Griffith University, n.d.), RMIT University (RMIT University, n.d.a), and Deakin University (Deakin University, n.d.) demonstrate emerging Al policies and ethical commitments. Similarly, ACU, Bond University, CQUniversity, ECU, Flinders University, Swinburne University, the University of Adelaide, the University of Newcastle, the UniSA, and the UniSC have begun addressing Al ethics through policies, digital literacy strategies, and graduate attribute updates. However, across the sector, these developments remain largely peripheral to AoL systems, with few institutions integrating Al's ethical and societal dimensions into curriculum mapping, program learning outcome monitoring, or graduate capabilities assessment. This highlights the need for AoL frameworks that support ethical, responsible, and future-focused Al engagement (Department of Industry, Science and Resources, 2025).
- Inconsistent student communication and transparency: Inconsistent student communication and transparency remain a significant challenge in the implementation of AoL processes across Australian universities. Institutions vary widely in how clearly and explicitly they communicate AoL expectations and their relevance to students' educational and professional development. This inconsistency can hinder student engagement, limit understanding of learning goals, and reduce opportunities for students to take ownership of their learning journeys, particularly in an Al-enhanced environment. While some universities provide more transparent and accessible AoL messaging (Bond University, n.d.a, UTS, n.d.a; UTS, n.d.b, University of South Australia, n.d.b), others offer minimal or largely implicit communication (CQUniversity, n.d., a; n.d.b, Flinders University, n.d.b, ACU, n.d.a),. This lack of transparency fails to contextualise Al capabilities within the broader landscape of employability, lifelong learning, and digital readiness, thereby disempowering students from actively engaging with assurance of learning processes and from developing the ethical and professional competencies needed in future workplaces.
- **Insufficient collaboration and benchmarking:** Despite shared sectoral challenges, there is limited visible cross-institutional collaboration or benchmarking specifically concerning AI-informed AoL. While institutions like the University of Adelaide (University of Adelaide, n.d.b) and UniSA (University of South Australia, n.d.a) identify educational quality and graduate capabilities as strategic goals, their AoL processes appear siloed. There is a lack of explicit cross-institutional alignment or direct reference to shared frameworks on AI-specific AoL processes, even with the availability of national guidance from TEQSA (TEQSA, 2023a, 2023b, 2024) and international standards from bodies like AACSB (AACSB, n.d.), EFMD/EQUIS (EFMD, 2021), and the UK's QAA (2024). These external guidelines provide crucial benchmarks and call for sector-wide engagement. Yet in practice, benchmarking activity in this space often relies on informal, individual networks rather than structured, transparent mechanisms for sectorwide comparison. This reliance on ad hoc connections limits the consistency, visibility and strategic value of benchmarking at scale (Murdoch, Samson & Laurence, 2025). The JSA's tripartite mandate for consultation within its Generative artificial intelligence capacity study (JSA, n.d) further highlights the importance of coordinated, cross-institutional collaboration to understand Al's impact on the workforce and education systems. This collective challenge demands a collaborative, rather than siloed, response from the higher education sector.

#### Reimagined AoL: towards a future-focused and systems-aware approach

Our analysis points to critical principles for a reimagined, future-focused approach to AoL in Al-rich environments.

• Dynamic curriculum alignment and real-time feedback loops: The necessity for dynamic curriculum alignment and real-time feedback loops is paramount. Moving away from static review cycles to continuous feedback mechanisms will enable agile adaptation of curriculum and assessment in response to rapid AI developments, as demonstrated by early movements at UniSA towards insights from learner data (University of South Australia, n.d.c) and UTS (University of Technology Sydney, n.d.c) towards real-

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time learner insights through analytics, further supported by Griffith's embedded monitoring (Griffith University, 2024).

- Integration of AI literacy and digital ethics in AoL processes: The integration of AI literacy and digital ethics in AoL processes is crucial for ensuring graduate preparedness. Graduate attributes must be redefined to explicitly include AI literacy, ethical considerations, and even prompt engineering skills, and these must be measurably assured through AoL systems. The University of Newcastle's policy, aiming to develop life-ready graduates in appropriate AI use and emphasising AI literacy and ethical understanding, exemplifies a strong commitment in this direction (University of Newcastle, n.d.b). This aligns directly with the National AI Centre's focus on responsible AI adoption and ethics principles (Department of Industry, Science and Resources, 2025). While Swinburne (Swinburne University of Technology, n.d.c), RMIT (RMIT University, n.d.b), Newcastle (University of Newcastle, n.d.a), Bond (Bond University, n.d.a), and Deakin (Deakin University, n.d.c) exemplify efforts in this area, developing clear, measurable indicators within AoL remains a critical, evolving step.
- Student-centric communication of AoL purpose and value: Clear and consistent communication that connects AoL to employability, lifelong learning, and digital capability is essential for fostering a shared understanding of learning goals and empowering students to navigate Al-enhanced learning effectively. Institutions excelling in this area, like the University of Sydney (University of Sydney, n.d.a; n.d.b), Bond (Bond University, n.d.a), and UTS (University of Technology Sydney, n.d.c), demonstrate how explicit links between AoL, employability, and digital capability can enhance student agency and the perceived value of their education. Institutions such as UniSC and CQUniversity could strengthen their communication strategies to articulate AoL relevance more explicitly, fostering greater student engagement and understanding.
- Cross-institutional benchmarking and collaborative innovation: The literature reveals limited examples of sector-wide collaboration or joint benchmarking to ensure consistent, scalable, and future-ready assurance processes. While recent guidance from the Tertiary Education Quality and Standards Agency (TEQSA, 2023a, 2023b, 2024a) has created a national impetus for action, a coordinated sectoral response remains largely absent. Collaborative efforts, such as the development of AI-informed AoL guidelines, shared benchmarking tools, and cross-institutional Communities of Practice, could provide much-needed agility and coherence across institutions (Kift, 2015). Harnessing the leadership and frameworks of peak bodies such as ACODE, AACSB, CAULLT, EFMD, and QAA could support the development of a more unified, sector-wide approach to Assurance of Learning. These organisations contribute models that could be adapted to address AI's pedagogical, ethical, and workforce implications within assurance systems. Deliberate cross-institutional collaboration is essential for driving meaningful educational transformation, for ensuring both student outcomes and graduate readiness for AI-integrated professional contexts.
- Industry lens and future-ready graduates: A future-focused AoL model must actively incorporate an industry lens and prioritise future-ready graduates. This involves explicit integration of industry feedback into curriculum design and a focus on assessing skills that demonstrate graduates' readiness for Al-rich professional environments. The JSA's *Generative artificial intelligence capacity study* (JSA, n.d) directly supports this by aiming to inform government strategy on Al's impact on the labour market and education. The National AI Centre's mission to "accelerate positive AI adoption and innovation that benefits Australia's business and community" (Department of Industry, Science and Resources, 2025) also underscores the critical link between higher education and workforce demands. The University of Newcastle's explicit connection of AI use to "life-ready graduates" (University of Newcastle, 2025b) and the University of Sydney's policy shift to allowing AI in assessments to prepare students for an AI-ubiquitous workforce (University of Sydney, 2024) are exemplars of this critical alignment.

#### Conclusion and future directions

This paper argues that AoL must shift from a static, compliance-focused model to a dynamic, systems-aware approach responsive to the realities of Al-enhanced education. While Australian higher education shows early signs of adapting, significant gaps remain in agility, integration, and collaboration. A reimagined AoL framework must embed AI literacy, promote authentic and inclusive assessment, and strengthen sector-wide partnerships ensuring graduates are prepared for the demands of an AI-driven world.

This transformation is vital to achieving synergy between human and artificial intelligence in education. AoL must enable AI to enhance, not replace, human judgment and critical thinking. Educators play a central role in

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designing Al-informed assessments and interpreting Al-generated learning data to guide continuous improvement. This paper serves as both a sector scan and a call to action, laying the groundwork for future research focused on embedding these principles into practice, evaluating Al literacy outcomes, and shaping institutional policy for quality learning assurance in a rapidly evolving digital landscape.

**Al Acknowledgment:** Google Notebook LM is used to summarise institutional documents and identify the common themes across these documents related to AoL. MS copilot (under institutional licensed account) is used for improving the clarity of text. Elicit and Scopus AI were used for supporting literature search.

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