ASCILITE 2026

The Future is Connection:

Collaboration, Creativity and Compassion in a Digital Society

Engineering Visible Thinking: A human-centred assessment framework for the Generative AI era

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Generative AI is changing how students complete assessments and demonstrate what they know. As AI tools become part of everyday study, final assessment submissions alone may not provide sufficient evidence of how students think, solve problems, or develop understanding throughout the learning process. This paper introduces Engineering Visible Thinking (EVT), a human-centred assessment framework designed for the AI era. Rather than focusing on whether students use AI, EVT focuses on designing assessments that generate multiple forms of evidence to support judgements about student learning. The framework is built around three connected elements: visible thinking, process evidence, and capability validation. The paper draws on the design of a new Applied IT degree and includes a detailed example from the first-year Networking Fundamentals course to illustrate the application of the EVT framework in practice. The paper argues that the real challenge is not detecting AI use but designing assessments that provide evidence to support judgements about students' learning and capability. By extending assessment beyond final products to include evidence of thinking, process and demonstrated competence, EVT offers a practical approach to assessment design that keeps people, not technology, at the centre of learning.

Keywords: Generative AI, assessment design, Engineering Visible Thinking (EVT), human-centred learning, authentic assessment, higher education, assessment framework

The assessment challenge in the AI era

Generative AI is significantly impacting higher education assessment and the ways students complete assessment tasks and produce academic work. Tools such as ChatGPT can support brainstorming, coding, writing and problem solving, making it increasingly difficult for educators to rely on final submissions as the primary evidence used to inform assessment judgements. Recent studies and sector guidance suggest that assessment needs to evolve alongside these technologies rather than simply focusing on detecting or restricting AI use (Luo, 2024; Tertiary Education Quality and Standards Agency [TEQSA], 2025; Weng et al., 2024).

The challenge is not whether students use AI. The real question is whether assessment provides enough evidence that students have developed the knowledge, thinking and capability the course is intended to build.

A well-written report or correctly functioning program may demonstrate a successful outcome, but it does not always show how decisions were made, what alternatives were considered, or whether the student can independently apply what they have learned.

Many current responses focus on AI policies, disclosure requirements and guidance on acceptable AI use (Perkins et al., 2024; TEQSA, 2026). These are important developments, but they do not fully address a more fundamental issue: what evidence should assessment collect to support judgements about student learning in AI-supported environments?

This paper argues that assessment design should extend beyond evaluating finished products to also generating additional forms of evidence of student thinking, learning processes and demonstrated capability. To support this approach, the paper introduces Engineering Visible Thinking (EVT), a human-centred assessment framework developed during the design of a new Applied IT degree. EVT is presented as a practical framework that can help educators redesign assessment while keeping people and learning at the centre in an AI-enabled world.

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Engineering Visible Thinking

The challenge for assessment is not simply to evaluate what students produce, but also to understand how they arrived there. In AI-enabled learning environments, students may use generative AI to support planning, coding, writing and problem solving. While these tools can enhance learning, they can also make it more difficult for educators to distinguish between a polished outcome and genuine evidence of learning. This requires renewed attention to assessment design that extends beyond evaluating final products by incorporating additional forms of evidence of student thinking and capability (Perkins et al., 2024; TEQSA, 2025).

Engineering Visible Thinking (EVT) was developed during the design of a new Applied IT degree as a practical response to this challenge. Rather than focusing on AI detection or restricting AI use, EVT provides a structured approach to designing assessments with the intention of making learning more visible while supporting responsible use of AI. The framework encourages educators to consider not only what students submit, but also what other forms of evidence may indicate student learning.

The term *Engineering* reflects the deliberate design of assessment to generate multiple forms of evidence that support judgements about students' thinking, learning processes and demonstrated capability, rather than relying solely on evidence that emerges incidentally through assessment activities. In other words, the evidence of thinking, learning and capability is intentionally designed into the assessment from the outset.

EVT is built around three connected design elements:

Visible Thinking focuses on making student reasoning explicit throughout the assessment. Students are expected to explain decisions, justify approaches and demonstrate how they reached their conclusions rather than relying solely on a final product.

Process Evidence aims to document student learning over time. This may include planning activities, drafts, milestones, design decisions, reflections or other artefacts documenting the student's learning journey and providing opportunities for feedback during the assessment process.

Capability Validation provides greater confidence that students can independently demonstrate the intended learning outcomes. This may involve presentations, demonstrations, oral examinations (vivas), supervised practical activities or other forms of validation that provide confidence that the submitted work reflects the student's own understanding and capability.

Together, these three elements shift assessment from evaluating outputs alone to building a richer picture of student learning. Figure 1 illustrates the Engineering Visible Thinking (EVT) assessment framework and its three interconnected design elements.

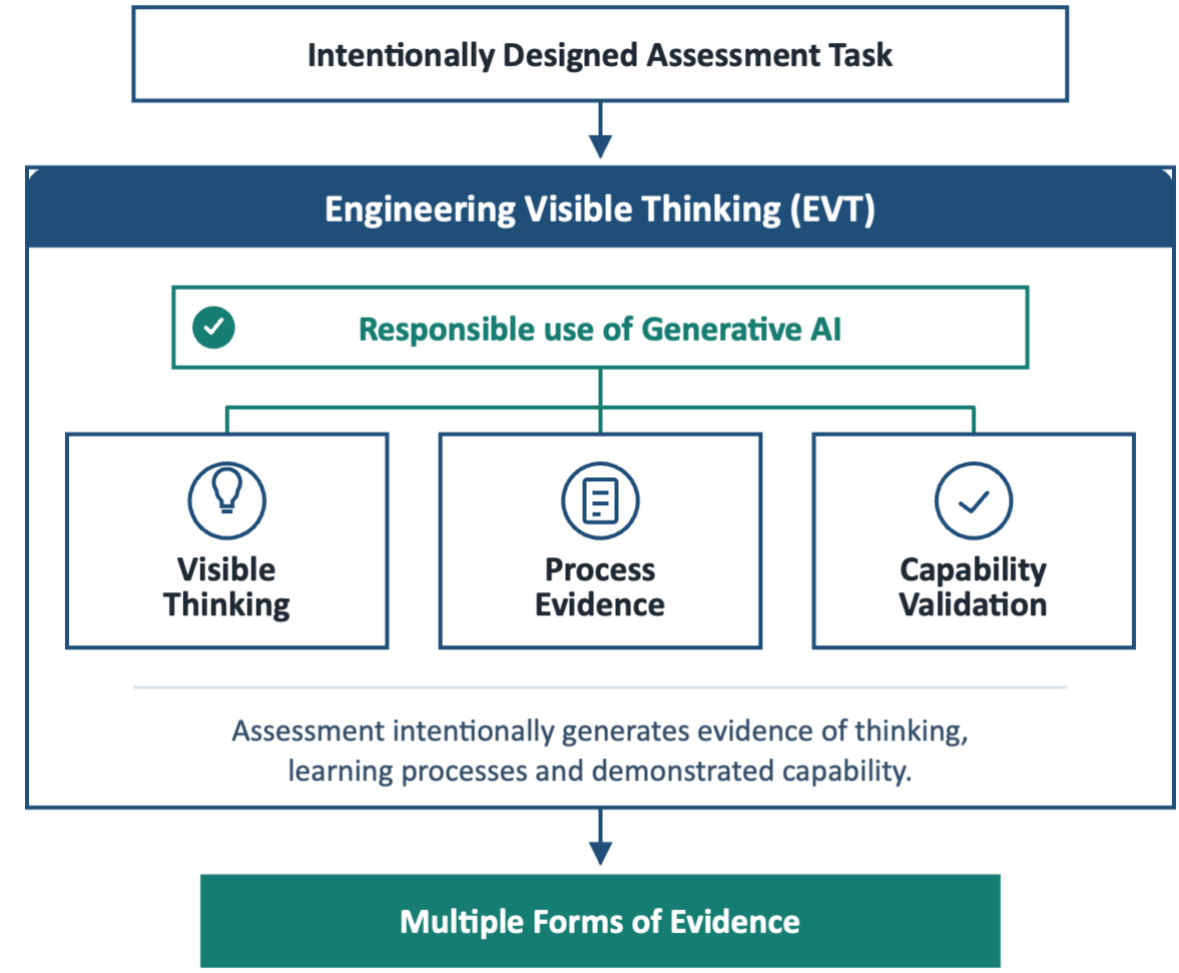


Figure 1. Engineering Visible Thinking (EVT) assessment framework.

Applying EVT in an Applied IT degree

Rather than being added to existing assessments, the framework was used from the beginning to shape how evidence of learning would be generated across the curriculum. The aim was to design assessments that encouraged students to think, explain their decisions, and demonstrate capability while recognising that generative AI would become a normal part of professional practice.

The framework informed the assessment design of a range of first-year courses, including programming, networking, cyber security and data science. Although the assessment tasks differed, each was designed around the same three EVT elements: making student thinking visible, collecting evidence of the learning process, and validating capability through authentic assessment activities.

One example from the first-year Networking Fundamentals course illustrates how the three EVT elements are intended to work together within a single assessment. Students are required to complete an enterprise network configuration and security assessment in which they design, implement and secure a simulated network while documenting their decisions and demonstrating their capability through multiple assessment activities.

Visible Thinking: Students document the reasoning behind their network design, security configurations and implementation decisions, explaining why particular approaches are selected and, where generative AI is used, justifying how AI-generated suggestions are evaluated and incorporated.

Process Evidence: Throughout the assessment, students progressively document their implementation process, troubleshooting activities and reflections. These artefacts support ongoing formative feedback and provide evidence of how their solution evolves, rather than relying solely on the final network configuration.

Capability Validation: The assessment concludes with a short, supervised viva in which students independently explain and justify their technical decisions and respond to questions about their implementation without the use of generative AI. Collectively, these activities illustrate how the three EVT elements generate multiple forms of evidence that support assessment judgements while allowing the responsible use of generative AI.

Rather than treating AI use as either prohibited or unrestricted, assessment tasks were designed to encourage responsible use of generative AI where appropriate while ensuring that students remained accountable for their thinking and decisions. Across the curriculum, reflection, justification, demonstrations and staged submissions are incorporated to provide multiple opportunities to generate evidence that supports assessment judgements throughout the assessment process.

The example illustrates that EVT is not a single assessment technique but a design framework that can be adapted across different disciplines and assessment types. Although this paper presents an example from an Applied IT degree, the principles of visible thinking, process evidence and capability validation are intended to support assessment design more broadly across higher education.

Discussion

The rapid adoption of generative AI has prompted many institutions to review assessment policies, introduce AI disclosure requirements and reconsider academic integrity practices (Luo, 2024; TEQSA, 2025). These responses are important, but they often focus on managing AI use rather than reconsidering what assessment is intended to measure. Recent assessment frameworks have also begun to provide practical guidance for integrating generative AI into assessment design (Furze et al., 2024; Perkins et al., 2024). EVT extends this work by focusing on the evidence assessment is designed to generate rather than the level of AI use.

Rather than viewing AI as a threat to assessment, EVT recognises that generative AI is likely to become a normal part of learning and professional practice. By making these forms of evidence explicit, assessment becomes less dependent on the quality of the final product and more focused on how students develop, justify and apply their knowledge.

Implementing EVT requires more than introducing new assessment tasks; it involves rethinking how assessment evidence is designed, collected and evaluated. Educators may need to redesign existing assessments, develop confidence in facilitating assessment processes that incorporate generative AI, and adopt approaches such as staged submissions, reflection and capability validation. Institutional support, professional development and appropriate assessment design resources are therefore likely to play an important role in successful implementation. While these changes require investment, they also provide an opportunity to strengthen assessment practices in ways that better align with AI-enabled learning environments.

The principles of Visible Thinking, Process Evidence and Capability Validation are independent of any specific technology or assessment type and can be adapted to written, practical, project-based and workplace learning contexts.

This paper introduces EVT as a proposed human-centred assessment framework for assessment design in the AI era. As the degree is implemented, future work will evaluate the framework across multiple courses and examine its impact on student learning, assessment quality and educator confidence in generative AI-supported learning environments.

Conclusion

Generative AI is changing higher education assessment and challenging how educators gather evidence of student learning. Rather than responding by focusing only on AI detection or restricting AI use, higher education has an opportunity to rethink what assessment is designed to achieve. The focus should remain on providing evidence that supports assessment judgements about students' ability to think critically, apply knowledge and demonstrate capability.

This paper has introduced Engineering Visible Thinking (EVT) as a human-centred assessment framework for assessment design in the generative AI era. By bringing together Visible Thinking, Process Evidence and Capability Validation, EVT provides a practical approach for designing assessments that generate multiple forms of evidence to support judgements about student learning while supporting the responsible use of generative AI.

As AI continues to evolve, assessment design must also evolve. Future work will evaluate the implementation of EVT as the degree is delivered and explore its application across other disciplines and higher education contexts.

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