2026 ASEE ANNUAL CONFERENCE June 21–24, 2026 | Charlotte Convention Center, NC

Host Sponsor UNC Charlotte

Paper ID #51851

Minimum Viable Assessment: A Faculty-Centered Framework for Sustainable Program Assessment

Prof. Suleyman Uludag, University of Michigan
Stephen Walter Turner, University of Michigan - Flint
Tyler Earl Judd, University of Michigan

Tyler Judd is a senior Computer Science student at the University of Michigan–Flint, currently completing his Bachelor's degree with a focus on high-impact technical research. A published scholar, Tyler has contributed to several academic publications, specializing in the integration of AI-driven cybersecurity, blockchain technology, and automating assessment.

Grace LaBelle, University of Michigan

Minimum Viable Assessment: A Faculty-Centered Framework for Sustainable Program Assessment

Abstract

Assessment and accreditation are foundational to computing and engineering programs, yet faculty resistance to program-level assessment remains a persistent challenge despite sustained institutional investment. This resistance frequently stems from perceptions of assessment as bureaucratic, administratively imposed, and misaligned with pedagogical practice. In this paper, we reframe program assessment as a sociotechnical problem, requiring attention not only to technical infrastructure but also to faculty roles, incentives, autonomy, and cultural alignment.

Drawing on multi-year experience with the Michigan System for Automated Assessment Accreditation (MSA^3), a Canvas-integrated platform developed to automate ABET-aligned assessment, we demonstrate why technical solutions alone are insufficient to achieve sustained faculty engagement. Despite reducing workload and improving data consistency, MSA^3 deployment revealed persistent resistance rooted in cultural misalignment, perceived loss of autonomy, and the framing of assessment as a compliance activity rather than a reflective academic practice.

These observations motivate the introduction of **Minimum Viable Assessment (MVA)**, a faculty-centered conceptual framework that explicitly bounds assessment effort while prioritizing transparency, shared ownership, and integration within existing academic workflows. To operationalize MVA, we introduce the **Conceptual Assessment Paradigm (CAP)**, which maps documented faculty resistance factors (such as time constraints, loss of autonomy, skepticism about value, and perceptions of top-down control) to concrete, low-effort assessment practices that departments can adopt incrementally without new data collection or additional administrative burden.

This approach supported the successful initial ABET accreditation of two programs without identified shortcomings related to assessment processes, demonstrating that bounded scope and sustainability can coexist with accreditation rigor. Rather than prescribing a fixed workflow, this position paper synthesizes relevant literature, introduces a faculty assessment dichotomy taxonomy, and proposes MVA and CAP as an actionable framework for fostering sustainable assessment culture in computing and engineering programs.

1 Introduction

Assessment and accreditation processes play a central role in maintaining educational quality and supporting continuous improvement in computing and engineering programs. Accrediting bodies such as ABET emphasize evidence-based practices and outcomes-driven evaluation; however, prior work consistently reports that many faculty perceive program-level assessment as a burdensome administrative responsibility [1, 2] that competes with core commitments to teaching, research, and service. This tension appears particularly pronounced in computing disciplines, where rapidly evolving technical curricula, diverse pedagogical approaches, and abstract learning outcomes complicate the design and sustainability of assessment practices.

Our experience with the **Michigan System for Automated Assessment Accreditation (MSA^3)** , a Canvas-integrated platform designed to automate outcome tracking, visualization, and reporting, illustrates both the promise and the limits of technical solutions. While MSA^3 reduced manual effort and improved assessment data quality, faculty engagement remained uneven despite initial interest. These challenges were not primarily related to tool usability, but instead reflected deeper misalignments involving institutional incentives, faculty roles, and the perceived purpose of assessment itself.

In this position paper, we argue that improving faculty engagement in program assessment requires more than improved tooling; it requires a conceptual and cultural reorientation of assessment practice. We introduce **Minimum Viable Assessment (MVA)**, a faculty-centered framework that prioritizes sustainability, transparency, and shared ownership while explicitly bounding effort as a design constraint. MVA reframes assessment as an authentic academic practice embedded within existing workflows, rather than as a standalone compliance activity. To operationalize MVA, we further introduce the **Conceptual Assessment Paradigm (CAP)**, which maps documented faculty resistance factors to concrete, low-effort strategies for assessment adoption.

The contributions of this work are threefold:

- A synthesis of prior literature in computing and higher education that identifies recurring faculty resistance factors and buy-in conditions affecting program-level assessment.
- The introduction of a *faculty assessment dichotomy*, a taxonomy that organizes these factors into impediments and leverage points for engagement.
- The proposal of the **Minimum Viable Assessment (MVA)** framework, operationalized through the **Conceptual Assessment Paradigm (CAP)**, offering actionable, incrementally adoptable strategies for departments seeking to align assessment practice with academic culture.

This work is intended to contribute to broader conversations within the computing and engineering education community regarding sustainable approaches to program assessment. Rather than advocating for a single technical solution, we propose an integrated sociotechnical perspective that recognizes both institutional constraints and the professional values of computing educators.

The remainder of the paper is organized as follows. Section 2 describes the MSA^3 system and its role as a motivating context for this work. Section 3 presents the faculty assessment dichotomy derived from our literature synthesis. Section 4 defines the MVA framework, introduces CAP, and outlines actionable strategies linked to identified resistance factors. Section 5 concludes with implications for computing and engineering education.

2 Assessment Model: Continuous Improvement and MSA^3

The assessment platform described in this section is presented as the empirical catalyst motivating this work, rather than as a primary contribution of the paper.

While assessment is a foundational mechanism for continuous improvement in computing education, it is also a source of persistent concern across computing departments. Accrediting bodies such as ABET emphasize systematic assessment cycles, defining outcomes, measuring student attainment, and evaluating results to inform curricular decisions. However, these cycles can feel administratively burdensome and procedurally disconnected from the academic work that faculty value most. Prior research has noted that computing educators often find assessment efforts misaligned with disciplinary values or overly focused on compliance [3, 4, 5, **?**], and that discipline-specific factors, such as course structure, prerequisite knowledge, and pedagogical approach, further complicate the design of meaningful assessments in computing programs. Recent studies further highlight that many assessment methods in computing education lack alignment with authentic learning goals or professional competencies. Buffum et al. emphasize the inherent difficulties in developing valid and reliable computing assessments, underscoring the need for iterative design, outcome alignment, and rigorous validation within the discipline [6]. Moreover, the growing influence of generative AI introduces new challenges to traditional assessment strategies, prompting a re-evaluation of practices like grading and rubrics [7]. Faculty also report difficulties designing assessments that remain meaningful for non-CS majors, underscoring the need for more inclusive and context-aware approaches [8].

To address these challenges, we developed the *Michigan System for Automated Assessment Accreditation (MSA^3)*, a Canvas-integrated system designed to streamline and automate key steps in the ABET continuous improvement process. MSA^3 aligns with the standard ABET cycle shown in Figure 1, while embedding assessment within tools already familiar to computing faculty.

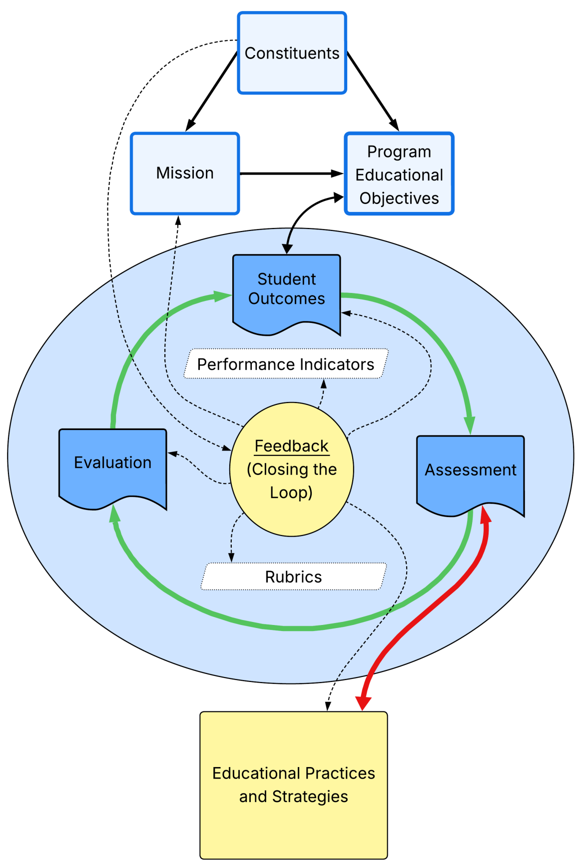

Figure 1: ABET Continuous Improvement Process.

Our core motivation was to design a system that reduced the administrative overhead of assessment, preserved data integrity, and improved faculty usability. While we achieved these technical goals, and our earlier studies reported strong faculty interest and reduced workload our previous work [9, 10] it became clear that infrastructure alone could not overcome resistance rooted in culture, incentives, or academic identity. This realization became the starting point for the present study.

2.1 System Design and Workflow

This section provides a brief overview of MSA^3. The *MSA*^{3} system (Figure 2) automates the assessment lifecycle by embedding data collection directly into existing faculty workflows. The system is built on four core integration points:

- LMS Integration (Canvas): Learning outcomes are embedded directly into course rubrics. Faculty perform assessments during routine grading, eliminating the need for separate data entry. An example of one of these rubrics is shown in Figure 3.
- Automated Data Extraction: Using Canvas APIs, student performance data is automatically retrieved, cleaned, and stored in a central Oracle SQL database. This is achieved through several different python scripts hosted in a secure GitLab pipeline.
- Longitudinal Visualization: A Tableau dashboard provides real-time, interactive views showcasing trends across semesters, courses, and individual programs. Our assessment dashboard is shown in Figure 4.
- Administrative Orchestration: System administrators manage outcome mappings centrally, which are then pushed to relevant courses automatically, ensuring department-wide consistency without manual faculty intervention.

2.2 Deeper Issues

Despite these technical accomplishments, the deployment of *MSA*^{3} revealed a deeper problem: faculty adoption and engagement were uneven and driven more by institutional dynamics than tool design. That realization served as a starting point for this paper. We shift from presenting *MSA*^{3} as a solution to arguing that technology must be paired with cultural change to foster assessment practices that are sustainable, empowering, and pedagogically meaningful in computing education.

Although the platform addressed several logistical challenges associated with program assessment, its deployment highlighted an important limitation: improvements in efficiency and data consistency did not consistently translate into sustained faculty engagement. This observation motivated a broader examination of faculty resistance factors and informed the development of the Minimum Viable Assessment (MVA) framework, which reframes assessment as a sociotechnical rather than purely technical challenge.

3 Rethinking Faculty and Assessment – post-MSA^3

Our earlier studies [9] [10], found that preliminary faculty surveys revealed positive perceptions of the *MSA*^{3} system, raising expectations for broad faculty buy-in. While some instructors

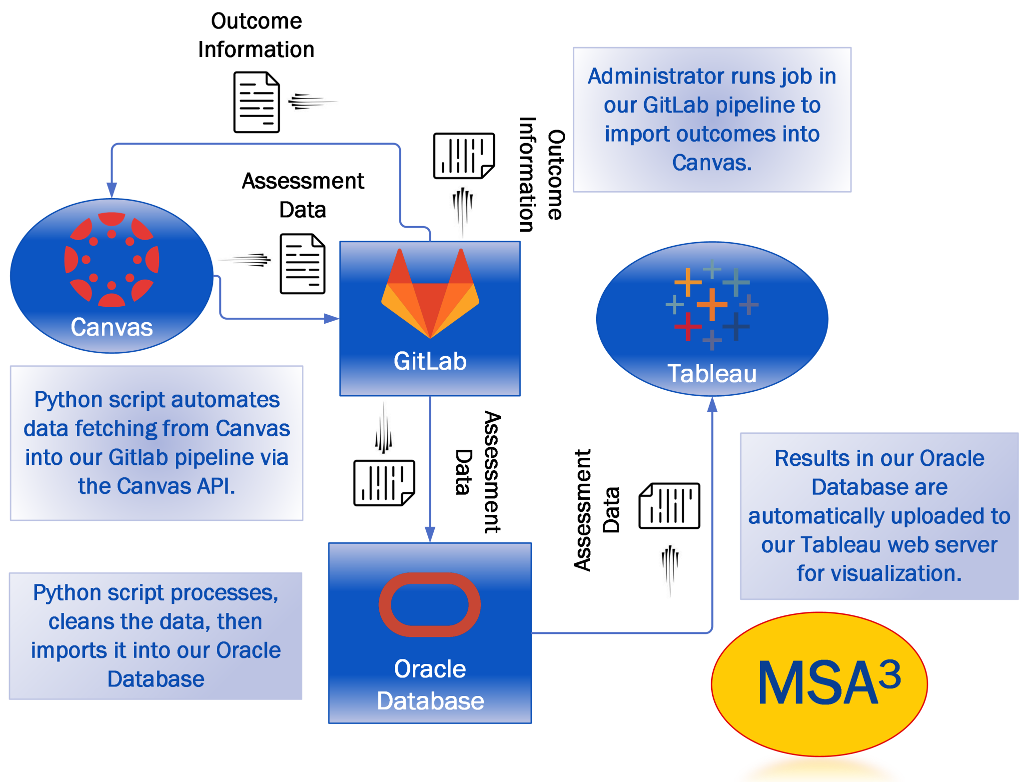

Figure 2: *MSA*^{3} System High Level Diagram.

embraced the platform, a notable portion continued to resist active engagement. This mixed response prompted us to look beyond infrastructure and investigate the deeper institutional and cultural dimensions of faculty resistance in computing education assessment.

Faculty engagement is essential to the sustainability of meaningful assessment, yet resistance remains widespread [14, 1]. Understanding the roots of this resistance is critical, not only to improve practice but also to inform the design of culturally and pedagogically aligned systems. In computing education, where assessment must often capture abstract competencies, evolving technical content, and varied pedagogical philosophies, these barriers are especially pronounced [6]. This section summarizes our literature review and introduces a novel taxonomy of the complex relationship between faculty and assessment, which we refer to as the *faculty assessment dichotomy*, illustrated in Figure 5. Drawing from prior research and our deployment experiences, we categorize this relationship into two main clusters: impediments and opportunities for buy-in.

3.1 Resistance

Resistance is rarely simple refusal. It often reflects layered concerns over time constraints, administrative burdens, and perceived threats to academic autonomy [27, 14, 1]. Eickholt [33] notes that nearly 43% of faculty disagreed they had sufficient time to revise their teaching practices, even when motivated to do so. Fisher [23] argues that accreditation frameworks like ABET are sometimes misaligned with faculty pedagogical goals, contributing to

ABET Rubric

Criteria	Ratings					Pts
ABET SLO COM 1 (PI 1.1) Demonstrate the ability to provide justification for the selection of an appropriate algorithm threshold: 3.0 pts	**4 pts** **Exceeds Mastery: Demonstrates exceptional understanding or proficiency that goes above and beyond expectations, showcasing superior mastery in the area.**	**3 pts** **Advanced Mastery: Shows a higher level of understanding or proficiency beyond what is expected, indicating a strong grasp of the subject matter.**	**2 pts** **Mastery: Demonstrates a solid understanding or proficiency in the area, meeting the expected level of competency.**	**1 pts** **Beginning Mastery: Basic understanding or proficiency is demonstrated, but significant improvement is needed to achieve mastery.**	**0 pts** **No Evidence**	4 pts
ABET SLO COM 1 (PI 1.2) Use a divide-and-conquer algorithm to solve an appropriate problem. threshold: 3.0 pts	**4 pts** **Exceeds Mastery: Demonstrates exceptional understanding or proficiency that goes above and beyond expectations, showcasing superior mastery in the area.**	**3 pts** **Advanced Mastery: Shows a higher level of understanding or proficiency beyond what is expected, indicating a strong grasp of the subject matter.**	**2 pts** **Mastery: Demonstrates a solid understanding or proficiency in the area, meeting the expected level of competency.**	**1 pts** **Beginning Mastery: Basic understanding or proficiency is demonstrated, but significant improvement is needed to achieve mastery.**	**0 pts** **No Evidence**	4 pts
ABET SLO COM 1 (PI 1.3) Apply appropriate principles to analyze a complex computing problem. threshold: 3.0 pts	**4 pts** **Exceeds Mastery: Demonstrates exceptional understanding or proficiency that goes above and beyond expectations, showcasing superior mastery in the area.**	**3 pts** **Advanced Mastery: Shows a higher level of understanding or proficiency beyond what is expected, indicating a strong grasp of the subject matter.**	**2 pts** **Mastery: Demonstrates a solid understanding or proficiency in the area, meeting the expected level of competency.**	**1 pts** **Beginning Mastery: Basic understanding or proficiency is demonstrated, but significant improvement is needed to achieve mastery.**	**0 pts** **No Evidence**	4 pts

Figure 3: Example Canvas Assessment Rubric

disengagement.

Broader cultural resistance may include emotional stages, akin to grief, denial, anger, negotiation, depression, and eventual acceptance, as described by Tarnoff et al. [27]. These reactions reflect not just individual reluctance but deeper tensions between institutional demands and academic identity [11]. Fisher [23] and Andrade [13] highlight how top-down or punitive structures can amplify resistance. Dinglasan [22] notes that discipline-specific norms—especially concerns over academic control—further reinforce disengagement.

Deneen and Boud [14] frame some of this opposition as "epistemic resistance," where faculty question the foundational logic of outcomes-based frameworks. Dueben [2] found faculty often felt excluded from assessment design, reporting feelings of resentment and anxiety. Similarly, Ernest et al. [12] show that when faculty are treated as implementers rather than co-creators, mistrust deepens and participation declines.

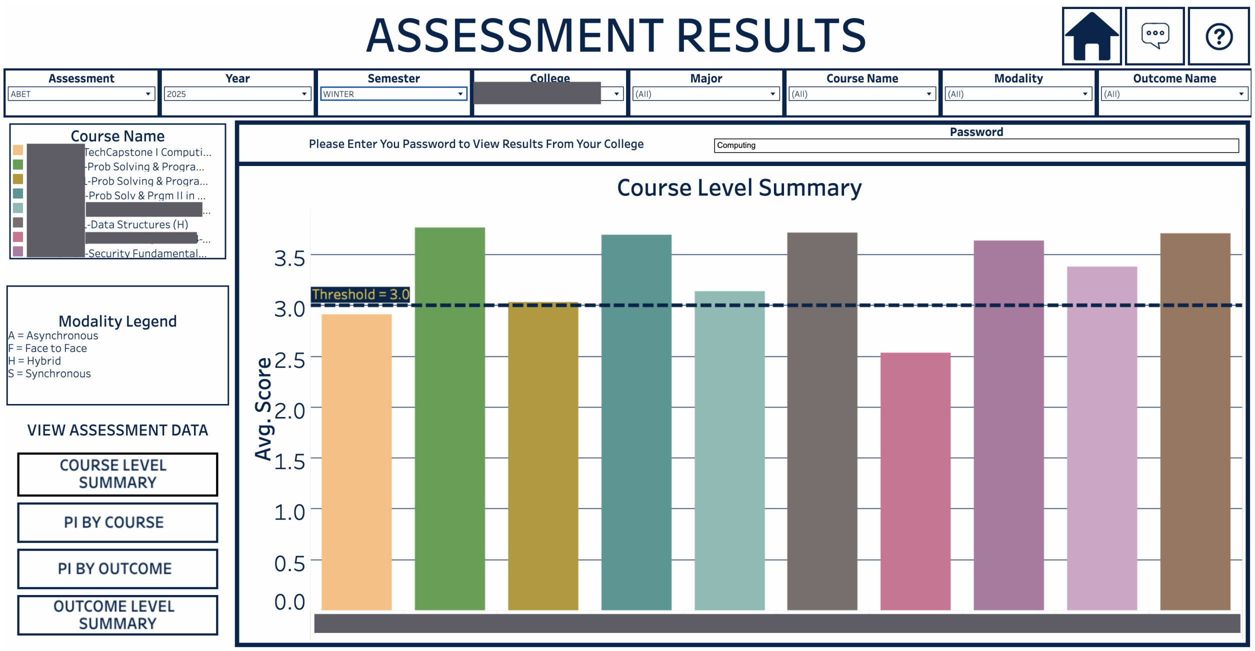

Figure 4: Assessment Dashboard.

3.2 Barriers to Engagement

Faculty disengagement is shaped not only by attitude but also by systemic conditions. Overloaded teaching schedules, growing administrative duties, and the expanding scope of documentation dilute time and attention available for meaningful participation [31, 13]. These burdens are exacerbated when institutional support, training, or clarity around assessment goals is lacking [1, 11, 32].

Structural misalignment is also common. Dueben [2] found that faculty who are excluded from assessment planning often perceive it as an externally imposed process. Fisher [23] critiques how accreditation-driven expectations often diverge from actual teaching practices. Andrade [13] notes that when results are used punitively, the perceived risks of participation can outweigh the benefits. In computing specifically, the difficulty of capturing abstract competencies, such as problem decomposition and knowledge transfer across programming contexts, makes standardized assessment rubrics particularly hard to align with what faculty actually teach [**?**].

Technology alone cannot solve these issues. Schahczenski and Van Dyne [18] describe how manual or disconnected systems intensify faculty burden. Even when faculty are willing, competing demands and unclear systems frequently limit sustained engagement [33, 18, 1, 11].

3.3 Designing for Buy-In

Despite these challenges, the literature offers strategies for cultivating faculty engagement. Effective models center faculty agency, promote reflective practice, and build shared ownership. Pham [1] highlights how aligning assessment workflows with departmental routines and leadership can promote sustained involvement. Ernest et al. [12] and Muljana [11] emphasize that

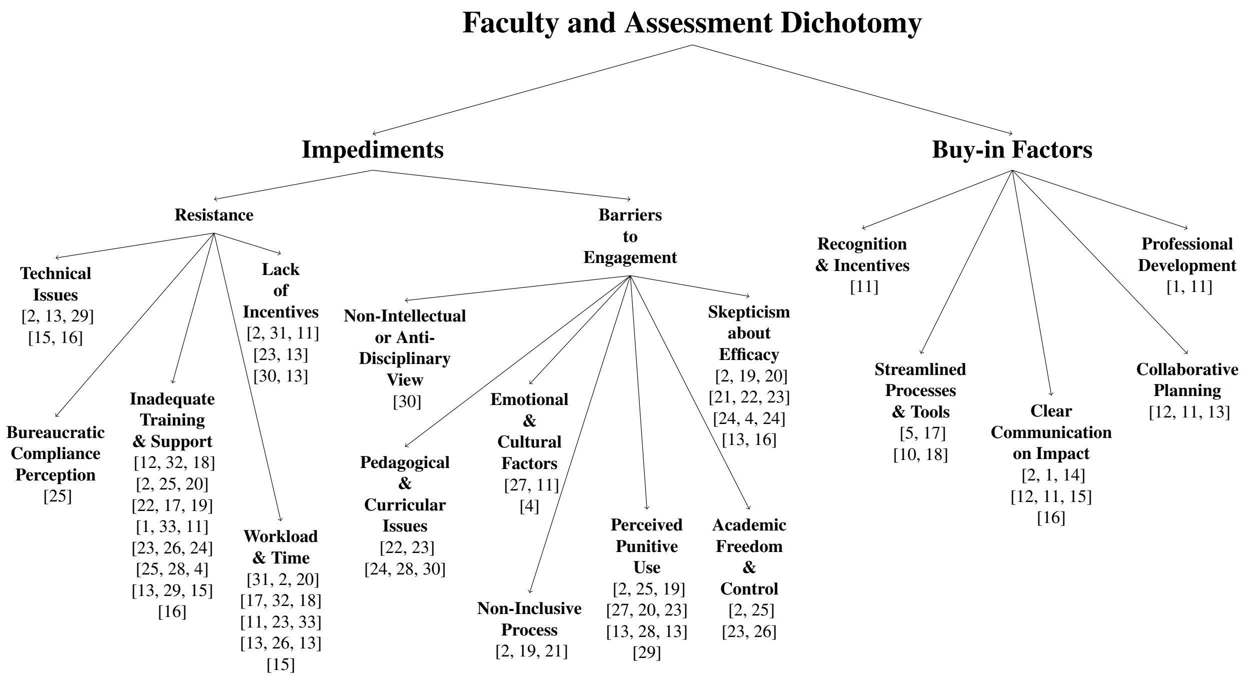

Figure 5: Faculty and Assessment.

early-stage involvement improves faculty trust and participation.

Juliano [5] and our previous work [9] [10], show that automation and transparent visualization, such as dashboards, can build trust and reduce friction.

Faculty are also more likely to engage when assessment work is recognized. This includes formal incentives such as stipends or course releases and informal ones such as acknowledgment in review processes [1, 17, 11]. Most importantly, assessment must be experienced as intellectually meaningful. When it enables peer discussion, reflection, and pedagogical growth, as shown in Ernest et al. [12] and Burbano et al. [17], faculty report greater satisfaction and willingness to participate.

Ultimately, meaningful engagement cannot be engineered through compliance alone. It requires thoughtful system design, inclusive structures, and cultural alignment that respects academic autonomy while promoting shared educational goals.

This work does not aim to evaluate the effectiveness of specific assessment interventions. Rather, it synthesizes findings from prior literature with observations from system deployment to identify recurring faculty resistance patterns and to motivate a conceptual reframing of assessment practice. The Minimum Viable Assessment framework and its associated strategies are therefore proposed as design-informed guidance, not as empirically validated outcomes.

4 Minimum Viable Assessment: Strategies for Success

Our literature review and system deployment experience revealed a broad set of faculty resistance factors that consistently undermine program-level assessment in computing education. While the MSA^3 system addressed many logistical and technical barriers-such as data collection,

Table 1: Conceptual Assessment Paradigm (CAP).

	MVA Action Items					
Resistance Factors & Barriers	***MSA*[3]**	**Training & Support**	**Acknowledge Faculty Contributions**	**Offer Institutional Support**	**Faculty-defined success criteria**	**Involve Faculty in Development**
Workload and time	✓	✓		✓		
Inadequate Training & Support		✓		✓		
Lack of Incentives			✓			
Skepticism about Effectiveness		✓			✓	
Academic Freedom & Control	✓		✓			✓
Perceived Punitive Use		✓	✓			
Non-Inclusive Process	✓	✓		✓		
Emotional and Cultural Factors			✓	✓		
Pedagogical and Curricular Issues		✓				✓
Perception as Bureaucratic Compliance		✓	✓		✓	✓
Technical Issues	✓	✓		✓		✓
Non-Intellectual or Anti-Disciplinary Views		✓		✓		✓

aggregation, and visualization-it became evident that automation alone was insufficient to achieve sustained faculty engagement. Persistent challenges related to academic autonomy, perceived workload, cultural misalignment, and the framing of assessment as bureaucratic compliance remained largely unresolved.

To address these challenges, we propose **Minimum Viable Assessment (MVA)** as a conceptual framework for rethinking assessment practice. MVA defines assessment not as a maximal or comprehensive reporting exercise, but as the *smallest set of practices necessary to support meaningful reflection, continuous improvement, and faculty participation*. An assessment approach is considered "minimum viable" if it (1) leverages evidence already produced through normal teaching activities, (2) minimizes additional procedural and cognitive overhead, (3) preserves faculty agency over interpretation and use of results, and (4) embeds assessment within existing academic workflows rather than treating it as a separate compliance task.

MVA is grounded in three core principles: *faculty-centered participation*, which emphasizes ownership and professional judgment over external accountability; *minimum viable complexity*, which prioritizes lightweight, sustainable processes over exhaustive data collection; and *cultural alignment*, which ensures assessment practices respect disciplinary norms and academic identity in computing. These principles distinguish MVA from generic assessment best practices by explicitly bounding effort while foregrounding faculty autonomy and engagement as design constraints.

The **Conceptual Assessment Paradigm (CAP)** operationalizes MVA by translating these principles into concrete, repeatable practices that directly address known faculty resistance factors. As summarized in Table 1, CAP maps barriers such as time constraints, skepticism about value, lack of incentives, and fear of punitive use to specific actions-including reuse of existing course artifacts, faculty-defined success criteria, distributed assessment ownership, transparent data sharing, and inclusive development processes. This section constitutes the primary contribution of the paper by defining the MVA framework, operationalizing it through CAP, and presenting a smallest workable configuration for adoption.

4.1 Operationalizing MVA through the Conceptual Assessment Paradigm

While Minimum Viable Assessment (MVA) defines the guiding principles for sustainable assessment practice, these principles require concrete operationalization to be actionable within departments. The **Conceptual Assessment Paradigm (CAP)** serves this role by explicitly linking common faculty resistance factors to specific assessment practices that enact MVA principles in practice.

CAP is not intended as a prescriptive workflow or a fixed implementation model. Rather, it functions as a design mapping that departments can adapt to local context while preserving the core constraints of MVA: bounded effort, faculty agency, and integration within existing academic work. Each CAP practice is selected to address a documented resistance factor while minimizing additional cognitive or administrative overhead.

Table 1 presents CAP as a structured mapping between (1) resistance factors identified in the literature and our deployment experience, (2) the corresponding MVA design principle, and (3) concrete, low-effort assessment practices that departments can adopt incrementally. Importantly, these practices do not require new data collection or specialized infrastructure; instead, they repurpose existing instructional artifacts, governance structures, and collaborative norms already present in most computing programs.

The subsections that follow elaborate on these practices, illustrating how CAP enables departments to translate MVA from a conceptual stance into a viable, repeatable assessment culture.

4.2 Training, Resources, and Institutional Support

Persistent gaps in training and institutional scaffolding limit assessment engagement [1, 11, 32]. Faculty often report unclear expectations, limited documentation, or lack of support for navigating assessment procedures. These challenges erode confidence and fuel perceptions of assessment as opaque or punitive.

To counter this, institutions should invest in accessible, context-specific training. Resources should clearly communicate:

- The purpose and intended impact of assessment
- Individual and departmental roles and responsibilities
- Relevant timelines, tools, and feedback mechanisms

Such foundational support helps reframe assessment as a collaborative practice aligned with professional growth, not as an administrative burden.

4.3 Time Constraints, Workload, and Technical Issues

Time and workload remain dominant concerns across the literature [33, 2, 31]. Faculty view assessment tasks as time-consuming interruptions to teaching and research. These concerns are magnified by disjointed technical systems or non-standardized procedures.

MSA^3 was developed specifically to integrate assessment into faculty workflows through Canvas and Tableau. By automating data collection, storage, and reporting, the system reduces logistical burdens and supports consistency. This reflects the MVA principle of “minimum viable complexity”, removing procedural friction while preserving academic relevance.

4.4 Skepticism About Effectiveness

Faculty skepticism about the purpose and utility of assessment is well documented [23, 14, 6]. This often stems from a lack of visibility into how results are used to improve programs or student outcomes.

To build trust, institutions must make assessment data more transparent and actionable. As suggested by Juliano [5], interactive tools that promote data fluency can transform assessment into a meaningful feedback loop. MSA^3 supports this through longitudinal visualizations and program-level dashboards that help faculty draw connections between effort and impact.

4.5 Incentives for Faculty Motivation

Assessment remains undervalued in many institutional reward structures [17, 1]. Faculty often prioritize research or teaching over assessment because only the former are consistently recognized in evaluations or promotion criteria.

To shift this calculus, institutions may consider offering:

- **Monetary incentives**: stipends, internal grants, or performance bonuses
- **Non-monetary recognition**: course releases, leadership roles, integration of assessment into the teaching category in criteria for promotion, or public acknowledgment

Such incentives legitimize assessment as a scholarly activity and align with the MVA tenet that participation must be structurally supported.

4.6 Perception as Bureaucracy and Exclusion

When assessment is perceived as top-down, externally imposed, or misaligned with discipline norms, faculty engagement suffers [13, 23, 2]. This is especially true in computing, where pedagogical diversity and autonomy are highly valued.

To address this, we advocate for inclusive design processes that involve faculty in:

- Co-creating rubrics and outcomes
- Reviewing and interpreting results
- Defining thresholds for improvement

Assessment days or department-level roundtables, as seen in collaborative models [12], can foster shared ownership and demystify the process.

4.7 Academic Autonomy and Fear of Misuse

Many faculty express concern that assessment results could be used punitively or to override disciplinary judgment [27, 14]. These fears are often rooted in opaque reporting structures or past experiences with accountability frameworks.

The MVA model encourages transparency and explicitly decouples assessment from individual evaluation. MSA^3, for example, allows programs to define their own performance metrics and contextual interpretations. When faculty understand how their data will be used, and by whom, they are more willing to engage.

4.8 A Smallest Workable Configuration for Adopting MVA

Several reviewers of assessment reform have noted that well-intentioned frameworks often fail to translate into practice due to their perceived scale or implementation complexity. In response, we emphasize that Minimum Viable Assessment (MVA) is explicitly designed to be adoptable in small, incremental steps without requiring new software, additional data collection, or structural reorganization.

A department can enact a smallest workable configuration of MVA by implementing the following elements within a single assessment cycle:

- **One existing course artifact per program outcome**, selected by the course instructor (e.g., a final project, exam question, or lab report).
- **Faculty-defined success criteria** for each outcome, expressed in locally meaningful terms rather than externally imposed thresholds.
- **A shared, transparent summary of results**, accessible to all program faculty, emphasizing trends and patterns rather than individual performance.
- **One collective reflection opportunity** (e.g., an assessment day, department meeting, or retreat) focused on interpretation and improvement rather than compliance reporting.

Practical Implementation Sequence

In practice, departments adopting MVA may begin with the following minimal operational sequence:

1. Develop or refine a curriculum map linking required courses to program student learning outcomes.
2. Define performance indicators for each mapping with faculty input, expressed as measurable descriptions of expected competency.
3. Implement a common rubric structure (e.g., a standardized Likert scale) applied consistently across courses.
4. Embed one rubric criterion per outcome into existing Canvas assignments, allowing faculty to tag routine grading artifacts to outcomes. In our implementation, this process required approximately 30 seconds per student during normal grading activities.

These steps require no new assignments, no additional data collection, and no separate reporting forms.

Importantly, this configuration requires no new evidence generation and places decision-making authority with faculty, thereby addressing common resistance factors related to workload, autonomy, and perceived punitive use. Departments may expand or adapt this configuration over time; however, MVA does not require comprehensive coverage or full automation to be effective. Instead, it provides a baseline structure through which assessment can begin as a reflective, faculty-centered practice and evolve organically as local capacity and trust increase.

Within this configuration, adoption is reflected in the integration of mapped outcome artifacts, faculty-defined performance indicators, and the use of a shared, transparent summary of results. Because outcome-aligned rubric criteria are embedded within routine grading, faculty time-on-task per course per term remains bounded as described above. The cadence of this process aligns with the academic term: mappings and performance indicators are established prior to or at the start of the term, and outcome results are extracted at the end of the term to support collective reflection. This structure clarifies how MVA remains observable while preserving its bounded-effort design.

In our implementation context, this configuration supported successful initial ABET accreditation of two programs without any identified shortcomings related to assessment processes. This experience suggests that bounding scope and effort does not diminish rigor; rather, it improves sustainability and faculty participation while maintaining compliance.

4.9 Contribution and Novelty

The contribution of this work is not the introduction of a new assessment tool nor the proposal of additional compliance mechanisms for accreditation. Instead, this paper advances a reframing of program assessment as a sociotechnical system in which technical viability must be matched with cultural viability to achieve sustained faculty engagement. While many prior efforts emphasize comprehensive data collection, standardized processes, or tooling, Minimum Viable Assessment (MVA) explicitly bounds scope and effort as a design constraint and centers faculty autonomy, interpretation, and participation as first-order concerns.

The accompanying Conceptual Assessment Paradigm (CAP) distinguishes this work from general best-practice recommendations by providing a structured mapping between documented faculty resistance factors and concrete, low-effort assessment practices. Rather than prescribing a fixed workflow or institutional model, CAP offers an adaptable design framework that enables departments to incrementally adopt assessment practices aligned with local culture and capacity. In doing so, this work contributes a practical and transferable lens for understanding why assessment reforms succeed or fail, and how computing and engineering programs can move from compliance-driven processes toward sustainable assessment culture.

5 Conclusion

We argue that the primary contribution of this work lies in its reframing of program assessment as a sociotechnical design problem rather than a purely technical or procedural one. This reframing is articulated through the **Minimum Viable Assessment (MVA)** framework and its operationalization via the Conceptual Assessment Paradigm (CAP), which together emphasize bounded effort, faculty agency, and cultural alignment as essential conditions for sustainable assessment practice (Section 4.9).

Assessment for accreditation, internal improvement, and accountability remains essential to sustaining quality in computing education. Yet, as reflected in prior literature and our own deployment experience, assessment processes are frequently perceived by faculty as bureaucratic, burdensome, and misaligned with core academic values. Although the MSA^3 system successfully automated many logistical aspects of program assessment and improved data transparency, these technical gains alone were insufficient to overcome persistent resistance rooted in cultural, structural, and epistemic tensions.

In response, this position paper proposes MVA as a faculty-centered framework that complements, rather than replaces, assessment automation. By prioritizing ease of participation, shared ownership, transparency, and disciplinary relevance, MVA reframes assessment as a reflective academic practice embedded within existing workflows. The accompanying CAP table translates these principles into actionable strategies that address common resistance factors, offering practical guidance for computing programs seeking to foster more inclusive and engaged assessment cultures.

Importantly, MVA is intentionally designed for incremental adoption. Section 4.8 outlines a smallest workable configuration that departments can implement within a single assessment cycle without introducing new data collection or additional administrative burden. At the same time, we acknowledge that the framework is informed by a limited set of deployment contexts, and that systematic evaluation of faculty experience and long-term cultural impact remains an important direction for future work.

We invite the computing and engineering education community to engage with, critique, and extend the MVA framework. By reimagining assessment not as an extractive compliance activity but as an empowering, faculty-owned practice, programs can move toward more sustainable models that strengthen both accountability and academic integrity.

References

[1] N. T. T. Pham, "Faculty engagement in internal quality assurance of academic programs: A literature review," *Vietnam Journal of Education*, vol. 6, no. 1, pp. 10–19, 2022.

[2] R. M. Dueben, *Faculty attitudes toward assessment*. Washington State University, 2015. [Online]. Available: https://hdl.handle.net/2376/6210

[3] J. Kinzie, "Assessment for improvement: Faculty perspectives," in *Using Evidence of Student Learning to Improve Higher Education*. Jossey-Bass, 2013, pp. 21–38.

[4] G. D. Kuh, N. A. Jankowski, S. O. Ikenberry, and J. Kinzie, "Knowing what students know and can do," National Institute for Learning Outcomes Assessment, Tech. Rep., 2014.

[5] B. Juliano, "Full paper: Data visualization and faculty engagement in program assessment," in *ASEE PSW Section Conference*, 2020.

[6] P. S. Buffum, K. E. Boyer, E. N. Wiebe, and J. C. Lester, "A practical guide to developing and validating computer science assessments," in *Proceedings of the 46th ACM Technical Symposium on Computer Science Education (SIGCSE)*. ACM, 2015, pp. 622–627.

[7] S. MacNeil, S. Spurlock, and I. Applebaum, "Imagining computing education assessment after generative ai," 2024. [Online]. Available: https://arxiv.org/abs/2401.04601

[8] J. Hur, P. Chilana, K. Cunningham, D. Garcia, and M. Guzdial, "Assessments for non-cs major computing classes," in *Proceedings of the 55th ACM Technical Symposium on Computer Science Education (SIGCSE)*. ACM, 2024.

[9] S. W. Turner, T. Judd, A. Moore, and S. Uludag, "A framework for an automated assessment system," in *2023 International Symposium on Accreditation of Engineering and Computing Education (ICACIT)*. IEEE, 2023, pp. 1–6.

[10] S. W. Turner, T. Judd, and S. Uludag, "Experience implementing an automated assessment system for accreditation," in *2024 IEEE Frontiers in Education Conference (FIE)*, 2024, pp. 1–9.

[11] P. S. Muljana, P. M. Nissenson, and T. Luo, "Examining factors influencing faculty buy-in and involvement in the accreditation process: A cause analysis grounded in systems thinking," *TechTrends*, vol. 64, pp. 730–739, 2020.

[12] B. W. Ernest, A. Obery, M. Sullivan-Walker, M. Reaves, and K. Dahle-Huff, "Why did we do this? collective faculty motivations to engage in accreditation work." *Educational Research: Theory and Practice*, vol. 34, no. 1, pp. 69–81, 2023.

[13] M. S. Andrade, "Managing change—engaging faculty in assessment opportunities," *Innovative Higher Education*, vol. 36, pp. 217–233, 2011.

[14] C. Deneen and D. Boud, "Patterns of resistance in managing assessment change," *Assessment & Evaluation in Higher Education*, vol. 39, no. 5, pp. 577–591, 2014. [Online]. Available: http://dx.doi.org/10.1080/02602938.2013.859654

[15] C. A. McCullough and E. Jones, "Creating a culture of faculty participation in assessment: Factors that promote and impede satisfaction," *Journal of Assessment and Institutional Effectiveness*, vol. 4, no. 1, pp. 85–101, 2014.

[16] S. Emil, "Assessment for improvement in higher education: Faculty perception of and participation in program assessment," 2011, phD Dissertation.

[17] A. Burbano, G. V. Ulloa, J. Jaramillo, N. M. Villegas, L. M. Quintero, and A. Pachon, "Engaging faculty in continuous improvement: The context of an ABET accreditation process," in *2018 ASEE Annual Conference & Exposition*. Salt Lake City, Utah: ASEE Conferences, June 2018. [Online]. Available: https://peer.asee.org/30397

[18] C. Schahczenski and M. Van Dyne, "Easing the burden of program assessment: Web-based tool facilitates measuring student outcomes for abet accreditation," 2019.

[19] P. Hutchings, "Opening doors to faculty involvement in assessment," *NILOA Occasional Paper*, no. 4, 2010. [Online]. Available: https://www.learningoutcomesassessment.org/wp-content/uploads/2019/02/OccasionalPaper4.pdf

[20] L. Suskie, *Assessing student learning: A common sense guide*, 2nd ed. John Wiley & Sons, 2010.

[21] G. R. Baker, N. A. Jankowski, S. Provezis, and J. Kinzie, "Using assessment results: Promising practices of institutions that do it well," *National Institute for Learning Outcomes Assessment*, 2012. [Online]. Available: https://www.learningoutcomesassessment.org/wp-content/uploads/2019/02/OccasionalPaper23.pdf

[22] A. J. Dinglasan and J. L. Weible, "Higher education STEM faculty views on collaborative assessment and group testing," *Journal of Research in Science, Mathematics and Technology Education*, vol. 8, no. SI, pp. 315–334, June 2025. [Online]. Available: https://jrsmte.com/article/higher-education-stem-faculty-views-on-collaborative-assessment-and-group-testing-16436

[23] G. L. Fisher, "Rethinking abet accreditation of computer science degree programs," in *2017 ASEE Annual Conference & Exposition*, 2017.

[24] J. Kinzie, "Assessment for improvement: Faculty perspectives," in *Using evidence of student learning to improve higher education*, G. D. Kuh, S. O. Ikenberry, N. A. Jankowski, T. R. Cain, P. Hutchings, and J. Kinzie, Eds. Jossey-Bass, 2013, pp. 21–38.

[25] P. T. Ewell, "Assessment, accountability, and improvement: Revisiting the tension," *National Institute for Learning Outcomes Assessment*, 2009. [Online]. Available: https://www.learningoutcomesassessment.org/wp-content/uploads/2019/02/OccasionalPaper1.pdf

[26] D. Haviland, S.-H. Shin, and S. Turley, "Now i'm ready: The impact of a professional development initiative on faculty concerns with program assessment," *Innovative Higher Education*, vol. 35, no. 4, pp. 261–275, 2010.

[27] K. A. Tarnoff, E. D. Bostwick, and K. J. Barnes, "Assessment resistance: using kubler-ross to understand and respond," *Organization Management Journal*, vol. 18, no. 5, pp. 176–186, 2021.

[28] L. Suskie, *Assessing student learning: A common sense guide*, 2nd ed. Jossey-Bass, 2009.

[29] A. Driscoll and D. C. De Noriega, *Taking ownership of accreditation: Assessment processes that promote institutional improvement and faculty engagement*. Taylor & Francis, 2023.

[30] T. W. Banta, *Building a scholarship of assessment*. Jossey-Bass, 2002.

[31] S. Nakano, A. Beaupré-Lavallée, and O. Bégin-Caouette, "Accountability measures in higher education and academic workload: A ten-year comparison," *Brock education journal*, vol. 30, no. 2, pp. 116–116, 2021.

[32] M. A. R. Williams, "Barriers to faculty adoption of assessment: A case study in engineering," Doctoral Dissertation, University of North Dakota, 2024, theses and Dissertations. [Online]. Available: https://commons.und.edu/theses/6581

[33] J. Eickholt, "Barriers to active learning for computer science faculty," https://arxiv.org/abs/1808.02426, 2018.