Credit for Prior Learning in Engineering for Non-Degree Technicians: A Comparative Policy Analysis of Technician-to-Engineering Pathways

Mr. Anderson Keah, Florida International University

Anderson Keah is a Graduate Research Assistant in the Multidisciplinary Engineering and Computing Education, Systems and Management Department (ESM) at Florida International University, where his research examines Credit for Prior Learning (CPL) policies that accelerate engineering pathways for Technical Vocational Education and Training (TVET) or Career and Technical Education (CTE) graduates. A PMP-certified project manager with 6+ years' experience in technical and vocational education.

Dr. Bruk T Berhane, Florida International University

Dr. Bruk T. Berhane received his bachelorâ€™s degree in electrical engineering from the University of Maryland in 2003. He then completed a masterâ€™s degree in engineering management at George Washington University in 2007. In 2016, he earned a Ph

Daniel I. Adeniranye, Florida International University

Daniel Adeniranye [ah-deh-nee-RAHN-yeh] is a Ph.D. candidate in Engineering and Computing Education at Florida International University, where he serves as Instructor of Record for EGS 2053: Foundations of Interdisciplinary Engineering. He holds a B.Tech in Mechanical Engineering, a joint M.S. in Petroleum Engineering and Project Development, and an M.S. in Project Management. His research examines engineering transfer student pathways to four-year institutions, AI in education and workforce development, and culturally responsive pedagogy across U.S. and international contexts. He is the Immediate Past Chair of the ASEE Student Division.

Credit for Prior Learning in Engineering for Non-Degree Technicians: A Comparative Policy Analysis of Technician-to-Engineering Pathways

Abstract

Non-degree technicians often acquire technical knowledge and skills through military training, industry certifications, apprenticeships, Career and Technical Education (CTE), and workplace-based learning. Some of this prior technical learning may be college-level; however, when these learners pursue engineering degrees, such learning may go unrecognized or be applied only as elective credit, limiting its value toward degree progress. This study examines how Credit for Prior Learning (CPL) and Prior Learning Assessment (PLA) policies at ten institutions in the United States with Accreditation Board for Engineering and Technology (ABET)-accredited engineering programs recognize and apply prior technical learning associated with non-degree technicians.

Guided by credentialism, we conducted a comparative policy analysis of publicly available institutional documents. We coded five evidence types relevant to non-degree technicians: military learning, portfolio or work-based learning, industry credentials, CTE pathways, and apprenticeships. We then examined whether each type of evidence was recognized in the published policies of the ten institutions and whether those policies indicated how credit could apply toward engineering major requirements.

Findings show that recognition of prior technical learning was limited and uneven. Military technical training was the most visible pathway, largely because it is supported by established documentation systems such as the American Council on Education (ACE) and the Joint Services Transcript. In contrast, civilian forms of technical learning were far less visible: industry credentials and CTE pathways appeared only in Ohio State University's published policy, while apprenticeship training was not explicitly recognized in any institutional policy reviewed. None of the institutions' CPL policies clearly mapped these evidence types—military technical training, portfolio or work-based learning, industry credentials, CTE pathways, or apprenticeship training—to required engineering coursework.

These findings suggest that engineering CPL policies may recognize prior learning without clearly showing how that learning can support progress through required engineering coursework. To better support technician-to-engineering pathways, institutions need CPL policies that provide clearer mechanisms for evaluating hands-on technical learning and, where appropriate, applying validated learning toward required engineering coursework.

Keywords: *Credit for Prior Learning (CPL); Prior Learning Assessment (PLA); industry certifications; apprenticeships; military training; ABET; engineering pathways; educational equity*.

Introduction

Credit for Prior Learning (CPL), also referred to as Prior Learning Assessment (PLA), refers to policies and assessment practices used in higher education to evaluate and award

academic credit for learning not reflected on a traditional academic transcript [1], [2]. CPL can include several assessment mechanisms, such as standardized examinations, institutionally developed challenge examinations, portfolio review, and credit recommendations from organizations such as the American Council on Education (ACE) or the National College Credit Recommendation Service (NCCRS) [1], [3]. Standardized examinations may include nationally recognized exams such as the College-Level Examination Program (CLEP), DANTES Subject Standardized Tests (DSST), Advanced Placement (AP), or International Baccalaureate (IB). These mechanisms are intended to help institutions determine whether learning acquired outside formal academic pathways is equivalent to college-level learning.

This function of CPL is especially important for technicians whose technical knowledge and skills may be developed through multiple pathways, not all of which result in traditional academic credit. Technicians enter engineering pathways with different forms of preparation. Some hold associate-level credentials, some have bachelor's-level engineering technology preparation, and others have not completed a college degree in engineering, engineering technology, or a closely related technical field. This paper focuses on the latter group, referred to here as non-degree technicians. Although these technicians have not completed an engineering-related college degree, they may still hold non-degree credentials or documented technical preparation, including college-issued certificates, military training records, industry certifications, apprenticeship credentials, CTE credentials, vocational preparation, or workplace-based training. Some of this prior technical learning may be college-level, but it may not always be documented or recognized in ways that allow it to count toward an engineering degree.

Given that non-degree technicians' learning may not always be documented through official college transcripts or completed degree programs, its recognition depends on how institutions evaluate evidence of prior learning. This creates a challenge for CPL policy because hands-on technical learning is not always easily measured through standardized examinations. While standardized examinations may assess academic or content-based knowledge, they may not fully capture the technical competence developed through troubleshooting, equipment operation, repair, fabrication, systems maintenance, or other forms of applied technical work. Portfolio assessment, evaluated training, and other experience-based mechanisms may be better suited to documenting and evaluating this kind of learning [2], [3], [4]. The issue, therefore, is not that all prior technical learning from non-degree technicians should automatically receive college credit, but whether institutions have clear mechanisms for determining when such learning meets college-level expectations and how, where appropriate, it can count toward an engineering degree.

When such mechanisms are unclear or absent, prior technical learning from non-degree technicians may go unrecognized when they pursue engineering degrees. Broader CPL and transfer-credit research shows that even when prior learning is recognized, awarded credit may not always apply to required coursework and may instead count only as elective or general credit [5], [6]. For non-degree technicians pursuing engineering degrees, this raises an important concern: prior technical learning that may be college-level may still have limited value if it does not help students progress through the engineering curriculum. This concern is especially important in engineering, where curricula are often sequential, prerequisite-driven, and tightly structured. In

such programs, the value of CPL depends not only on whether credit is awarded but also on whether that credit counts toward required engineering coursework.

Although prior studies have examined CPL policies and practices across higher education, less attention has been paid to how institutions with Accreditation Board for Engineering and Technology (ABET)-accredited engineering programs address prior technical learning from non-degree technicians. Specifically, it remains unclear whether published CPL policies recognize prior technical learning that may be college-level and whether such learning, when recognized, can count toward required engineering coursework. This gap has broader equity implications because non-degree technicians may include veterans, first-generation students, low-income learners, rural learners, and racially minoritized learners whose technical knowledge and skills were developed outside traditional college pathways. When CPL policies do not clearly show how prior technical learning can be evaluated and applied toward engineering degree requirements, these learners may face repeated coursework, delayed degree completion, and additional financial burdens. Therefore, this study examines how CPL policies at institutions with ABET-accredited engineering programs recognize, document, and apply prior technical learning associated with non-degree technicians.

Purpose and Research Questions

This study addresses this gap by examining how CPL/PLA policies at institutions with ABET-accredited engineering programs recognize, document, and apply prior technical learning associated with non-degree technicians. The study is diagnostic in nature because it examines what published policies make visible, what they leave unclear, and how they indicate whether recognized learning can count toward required engineering coursework. The study examines whether institutions recognize prior technical learning that may be college-level, what forms of evidence are treated as legitimate in published policy, and whether recognized credit is positioned to support progress through the engineering degree or remains limited to elective, petition-based, or unclear pathways. Guided by credentialism, which explains how formal credentials can function as gatekeeping mechanisms, the study asks:

RQ1: How do institutions with ABET-accredited engineering programs recognize forms of prior technical learning associated with non-degree technicians in published CPL/PLA policy?

RQ2: When prior technical learning is recognized in policy, how is credit applied within engineering degree structures: toward required major courses, as elective credit, through petition-based review, or through unclear pathways?

RQ3: What forms of evidence are recognized in published policy as documentation of prior technical learning associated with non-degree technicians, including portfolios, military credit mechanisms, industry credentials, apprenticeships, CTE pathways, and state articulation frameworks?

To answer these questions, we analyzed publicly available CPL/PLA and credit-recognition documents from ten institutions with ABET-accredited engineering programs selected to reflect U.S. geographic variation. For each institution, we coded whether forms of prior

technical learning associated with non-degree technicians were recognized, what evidence types were identified, and whether credit was major-applicable, elective-only, petition-based, or unspecified. The equity implications of these policy patterns are discussed through the lens of credentialism.

Literature Review

CPL/PLA Mechanisms and Purposes

Credit for Prior Learning (CPL), also referred to as Prior Learning Assessment (PLA), is a framework used in higher education to award academic credit for learning acquired outside traditional academic pathways [1], [2], [10]. CPL does not provide a "free pass" into higher education; rather, credit is awarded through defined assessment processes. These processes may include standardized examinations, credit recommendations for military or workforce training, institutionally developed challenge examinations, evaluations of non-college training, and portfolio assessment [1], [2], [3], [7]. For learners whose knowledge and skills are not documented through traditional academic records, CPL can provide an important pathway for making prior learning visible. However, CPL also requires institutions to determine whether that learning meets college-level expectations before credit is awarded.

Scholars continue to debate which CPL methods are rigorous, valid, accessible, affordable, and scalable [2], [3], [11], [12]. Standardized examinations may be useful for evaluating content-based knowledge, while portfolio-based assessment allows learners to document and reflect on learning gained through work, training, and applied experience [13], [14]. This issue is relevant for hands-on technical learning, which may be difficult to capture through standardized examinations alone. Prior studies have also linked PLA portfolio completion to improved student outcomes, suggesting that CPL can support persistence and completion when credit is meaningfully awarded and applied [15].

Researchers also differ in how they describe the broader purpose of CPL. Some frame CPL primarily as a mechanism to improve completion, reduce time to degree, and lower educational costs for adult and working learners [7], [8], [15]. Others emphasize its reflective and developmental value, arguing that CPL can foster deeper learning and transformation by helping learners make meaning of prior experience [13], [16]. Together, these perspectives suggest that CPL is both a credit-recognition mechanism and a learning process. In this study, however, the central concern is whether CPL policies allow prior technical learning, which may be college-level, to count in ways that support progress toward engineering degree requirements.

Credit Recognition and Applicability in Engineering Education

For non-degree technicians pursuing engineering degrees, the recognition and application of prior technical learning may shape degree progress and completion [9], [11], [15], [17], [18]. Unlike technicians with associate-level or bachelor's-level engineering technology credentials, non-degree technicians may possess substantial technical competence without holding a formal college credential that is recognized by a university. Their learning may be developed through military training, industry certifications, apprenticeships, Career and Technical Education (CTE),

vocational preparation, or workplace-based experience. Because this learning is not always documented through conventional academic credentials, universities may face difficulty determining when it is equivalent to college-level learning.

Prior studies show that recognition of prior learning can be inconsistent and discretionary across higher education contexts [3], [5], [19], [20]. In engineering, this raises an important question for non-degree technicians: whether their prior technical learning is evaluated as college-level and whether that recognition helps them progress through required major coursework. Although technicians may bring practical, hands-on learning that aligns with the applied nature of engineering, engineering programs often include sequential curricula, prerequisite structures, and accreditation expectations that can limit how nontraditional credit is applied [3], [5], [19], [20]. Ford and Ford's analysis of military credit articulation in the University of North Carolina system, for example, illustrates how institutional governance and accreditation expectations can shape credit-recognition practices [19], [21]. These studies point to a central concern in engineering education: recognition alone does not guarantee progress toward a degree. Credit awarded only as elective credit may acknowledge prior learning without helping students move through the engineering curriculum. For non-degree technicians, the problem is not only whether their prior technical learning is recognized, but whether it is evaluated, credited, and applied in ways that help them satisfy required engineering coursework.

Institutional recognition of prior learning may also be shaped by organizational identity, status, and perceptions of credential legitimacy. Prior research suggests that institutions' approaches to recognizing prior learning can reflect strategic goals, quality-assurance concerns, and efforts to maintain prestige within higher education markets [22], [23]. Differences in institutional guidance, advising, and bureaucratic processes can also deter CPL participation, even when policies formally exist [24]. Therefore, limited recognition of prior technical learning may reflect not only questions of academic rigor but also institutional judgments about which forms of learning and documentation are considered legitimate. This is especially important for non-degree technicians because their technical competence may be substantial but documented through evidence forms that universities do not consistently recognize as credit-worthy.

Equity Implications and Gap in the Literature

The barriers to recognizing prior technical learning in engineering have important equity implications. Non-degree technicians may include veterans, first-generation students, low-income learners, rural learners, and racially minoritized learners whose technical knowledge and skills were developed outside traditional college pathways [6], [26], [27]. Evidence from broader CPL research suggests that when prior learning is awarded and applied meaningfully, adult and post-traditional learners may experience improved persistence, completion, and financial outcomes compared with similar learners who do not receive CPL credit [7], [8], [15].

However, few studies have systematically examined whether prior technical learning associated with non-degree technicians is recognized in ABET-accredited engineering programs and, if recognized, whether that credit applies to required major coursework or is limited to electives. This matters because credit that does not apply to degree requirements may provide symbolic recognition without meaningfully accelerating progress toward an engineering degree.

In addition, limited research distinguishes among technician categories, even though learners with associate-level preparation, bachelor's-level engineering technology preparation, and non-degree technical preparation may enter engineering pathways with different forms of academic recognition.

Taken together, these gaps leave unanswered whether current CPL policies in engineering expand meaningful pathways for non-degree technicians or provide recognition that does not substantially support degree progress. The key issue is not only whether potentially college-level prior technical learning is widely recognized, but also whether recognized learning is applied in ways that help non-degree technicians progress through required engineering coursework. This study addresses that gap by examining how published CPL policies at institutions with ABET-accredited engineering programs recognize, document, and apply prior technical learning associated with non-degree technicians.

Theoretical Framework

This study draws on credentialism to examine how engineering programs recognize or fail to recognize the prior technical learning of non-degree technicians. Credentialism refers to the reliance on formal educational credentials as markers of knowledge, skill, and legitimacy, often beyond what may be necessary to demonstrate competence [28]. Collins [27] argues that credentials can function less as direct measures of skill and more as gatekeeping mechanisms that regulate access to educational and occupational opportunities.

From a credentialist perspective, the value of a credential lies not only in the learning it represents, but also in the institutional legitimacy it carries. Applied to engineering education, credentialism suggests that prior technical learning may be more likely to receive credit when it is documented through familiar and institutionally trusted mechanisms, such as transcripts, ACE recommendations, military credit systems, or statewide articulation frameworks. By contrast, hands-on technical learning documented through workplace experience, industry certifications, apprenticeships, or CTE pathways may be less visible in university credit systems if it lacks recognized academic signals. This does not mean that all technical learning should automatically receive academic credit; rather, it suggests that institutions may be more willing to evaluate and recognize learning when it is documented through evidence forms they already consider legitimate.

This perspective is especially relevant for non-degree technicians, who may possess substantial engineering-relevant knowledge and skills without holding the formal academic credentials that institutions more readily recognize. Their prior technical learning may be college-level, but its recognition depends on whether institutions have mechanisms for evaluating, validating, and applying that learning within engineering degree structures. When prior technical learning is not recognized, or when it is recognized only as elective credit, CPL policies may reinforce a hierarchy that privileges formally credentialed academic learning over technical learning documented through less familiar or less institutionally trusted forms of evidence.

Credentialism guided both the coding and interpretation of this study. First, it directed attention to evidence legitimacy: which forms of prior technical learning were recognized, excluded, or left unaddressed in published policy. Second, it directed attention to credit

applicability: whether recognized learning was positioned to support substantive degree progress through major credit or remained limited to elective, petition-based, or unclear pathways. In this way, credentialism provides a lens for examining not only whether institutions recognize prior technical learning that may be college-level, but also whether that recognition meaningfully supports non-degree technicians' progress into engineering degrees.

Method

This study used a comparative institutional policy analysis design to examine CPL policies across selected institutions with ABET-accredited engineering programs. Comparative policy analysis is useful for identifying similarities and differences across institutions by examining how policies are defined, structured, and applied [28]. In this study, each institution's CPL policy was compared to identify recurring patterns, notable exceptions, and differences in how prior technical learning associated with non-degree technicians was recognized and applied.

Research Design

This study used a comparative qualitative document analysis design to examine how CPL/PLA and credit-recognition policies address prior technical learning associated with non-degree technicians. Comparative policy analysis is useful for identifying similarities and differences across institutional policies, while document analysis provides a systematic approach for reviewing and interpreting text-based evidence from publicly available documents [25], [28]. Because this study focuses on formal institutional policy positions rather than individual student experiences or internal implementation practices, publicly available CPL/PLA policies, transfer-credit policies, registrar guidance, and engineering program documents were appropriate data sources.

The study is diagnostic in nature. It examines what published policies make visible, what they leave unclear, and how they position prior technical learning within engineering degree structures. The primary analytic focus was not on all technicians, but specifically on forms of prior technical learning associated with non-degree technicians, including learning developed through military technical training, industry credentials, apprenticeships, Career and Technical Education (CTE), vocational preparation, and work-based experience.

Positionality Statement

The first author is a graduate research assistant and first-year Ph.D. student in Engineering and Computing Education at Florida International University. I hold a BSc in Mining Engineering, a Craft Certificate in Machining, and a Technical and Vocational Education and Training (TVET) teacher training certificate. I have also taught machining at a public TVET institution. These experiences shape how I understand hands-on technical learning and why I care about technician-to-engineering pathways, particularly for non-degree technicians whose competence is often developed outside formal college pathways.

Because this study analyzes publicly available CPL/PLA policy documents, my background may lead me to view expanded CPL recognition as beneficial and to interpret

restrictive or unclear policy language as a form of gatekeeping. To manage this, I used explicit coding rules, counted recognition only when an evidence type was clearly named in policy, and coded major applicability only when policy language explicitly indicated how credit could apply. I also maintained an audit trail through the cross-case matrix, re-coded a subset of institutions to check consistency, and engaged peer colleagues outside TVET to challenge my interpretations.

Sample Selection

This study used purposive sampling to select institutions for analysis. Purposive sampling is appropriate for qualitative research when cases are intentionally selected because they are information-rich and aligned with the study purpose and research questions [29], [30]. Because the goal of this comparative policy analysis was to examine policy patterns across cases rather than to generalize statistically to all engineering institutions, purposive sampling was appropriate.

Institutions were selected using three criteria: (1) the institution hosted at least one ABET-accredited engineering program [21]; (2) the institution had publicly available CPL/PLA, credit-recognition, military-credit, transfer-credit, or related policy documents; and (3) the sample reflected geographic variation using Bureau of Economic Analysis (BEA) regional groupings [31]. BEA groups the 50 states and the District of Columbia into eight regions [31]. To ensure geographic spread while maintaining a manageable sample size, five of the eight BEA regions were selected: Mideast, Southeast, Great Lakes, Southwest, and Far West. Two institutions were selected from each region, resulting in a final sample of ten institutions.

Table I. Sample Institutions by BEA Region (n = 10)

BEA Region	Institution	Location
Mideast	Penn State University	University Park, PA
Mideast	Stony Brook University (SUNY)	Stony Brook, NY
Southeast	Georgia Institute of Technology	Atlanta, GA
Southeast	Virginia Tech	Blacksburg, VA
Southwest	Arizona State University	Tempe, AZ
Southwest	Texas State University	San Marcos, TX
Great Lakes	Purdue University	West Lafayette, IN
Great Lakes	The Ohio State University	Columbus, OH
Far West	University of Washington	Seattle, WA
Far West	Oregon State University	Corvallis, OR

Data Collection Procedures

Data collection occurred between August 2025 and January 2026 using a standardized search protocol. For each institution, we searched registrar, admissions, transfer-credit, military-credit, prior-learning, and engineering college or department webpages. Search terms included “credit for prior learning,” “prior learning assessment,” “military credit,” “ACE,” “JST,” “CCAF,” “portfolio,” “experiential learning,” “credit by examination,” “industry certification,” “apprenticeship,” “CTE,” and “transfer credit.”

For each institution, we completed four steps. First, we identified publicly available CPL/PLA and credit-recognition documents. Second, we reviewed engineering college or department webpages and handbooks for program-level restrictions, additional requirements, or references to credit applicability. Third, we extracted policy language related to evidence types associated with non-degree technicians, including military learning, portfolio or work-based learning, industry credentials, apprenticeships, and CTE pathways. Fourth, we recorded credit application only when explicitly stated in policy language, coding whether recognized credit was major-clear, major-petition, elective-only, or unclear.

Analytical Framework and Coding Scheme

We used a deductive coding approach to analyze publicly available CPL/PLA and credit-recognition policy documents [32], [33]. The coding framework was informed by the research questions and by credentialism, which directed attention to two central dimensions: evidence legitimacy and credit applicability. Evidence legitimacy refers to whether policies recognized, excluded, or did not address particular forms of prior technical learning associated with non-degree technicians. Credit applicability refers to whether recognized learning was positioned to support progress through engineering degree requirements or remained limited to elective, petition-based, or unclear pathways.

Each institution was coded using the framework in Table II. The evidence-type codes were MIL, PORT, APP, IND, and CTE. Recognition was coded as Yes, No–NA, or No–EX. Application was coded as Maj–Clear, Maj–Pet, Elective, or Unclear. These codes enabled the analysis to distinguish between policies that clearly recognized a form of prior technical learning and those that either excluded it, did not address it, or recognized it without clarifying how credit would apply.

Table II. Coding Framework for Policy Analysis

Dimension	Codes
Evidence type	MIL; PORT; APP; IND; CTE
Recognition	Yes; No–NA; No–EX
Application	Maj–Clear; Maj–Pet; Elective; Unclear

Note. *MIL = military learning documented through JST/CCAF or evaluated using ACE/NCCRS recommendations when explicitly referenced. PORT = portfolio, experiential, or documented work-based learning evaluated against course outcomes or student learning outcomes by faculty or department. APP = registered apprenticeship credential explicitly listed as eligible evidence. IND = industry credentials or certifications explicitly listed in policy or included in credential-to-credit frameworks, such as ITAG. CTE = career-technical programs, certificates, or CTE-to-credit frameworks, such as CTAG. Recognition: Yes = explicitly recognized in policy; No–NA = not addressed in policy; No–EX = explicitly excluded in policy. Application: Maj–Clear = published equivalencies or explicit major-course satisfaction; Maj–Pet = major use possible through petition or departmental review; Elective = restricted to elective or unspecified transfer credit; Unclear = recognized but application not specified.*

Coding Consistency and Trustworthiness

Coding was conducted by one coder using the deductive coding framework in Table II. To support consistency, the coder re-coded two institutions, Stony Brook University and Arizona State University, and compared the results with the initial coding. When interpretation issues arose, such

as ambiguous policy language or missing statements about major applicability, the coder returned to the source policy text and applied a conservative decision rule: an evidence type was coded as recognized only when explicitly named in policy, and application to major requirements was coded only when explicitly stated. Otherwise, the application was coded as unclear.

The cross-case matrix served as the audit trail for extraction decisions and coding outcomes. This approach was especially important because the study focuses on prior technical learning associated with non-degree technicians, which may be documented through nontraditional forms of evidence rather than formal academic coursework. Peer colleagues outside TVET also reviewed selected interpretations to challenge assumptions and reduce the likelihood that the analysis would overread restrictive or unclear policy language.

Findings

All ten institutions in the sample maintained formal Credit for Prior Learning (CPL) or Prior Learning Assessment (PLA) policies. However, the extent to which these policies recognized prior technical learning among non-degree technicians varied substantially. Table III summarizes the evidence types identified in published policy documents and whether those forms of evidence were clearly connected to engineering major applicability.

TABLE III. Recognition and Application of Prior Technical Learning Evidence in Published Policy (n = 10)

Evidence Type	Mentioned or Recognized in Published Policy	Institutions	Major Applicability
Military learning (MIL)	8 of 10	Penn State; Stony Brook; Virginia Tech; Arizona State; Texas State; Purdue; Ohio State; Oregon State	Usually subject to departmental review, petition, or transfer evaluation; no published engineering major-course equivalencies identified
Portfolio/work-based learning (PORT)	2 of 10	Penn State; Texas State	Outcome-based; typically requires faculty or departmental approval
Industry credentials (IND)	1 of 10	Ohio State	Structured pathway exists through ITAG; major applicability is not guaranteed
CTE pathways (CTE)	1 of 10	Ohio State	Pathway exists through CTAG; engineering major applicability is not explicit
Apprenticeships (APP)	0 of 10	None	Not explicitly recognized in published policy

RQ1: How do institutions with ABET-accredited engineering programs recognize forms of prior technical learning associated with non-degree technicians in published CPL/PLA policy?

The policy review shows that recognition of prior technical learning associated with non-degree technicians was limited and uneven across the ten institutions. Military learning was the most visible pathway in published policy. Eight of the ten institutions referenced mechanisms such as the American Council on Education (ACE), the Joint Services Transcript (JST), or the Community College of the Air Force (CCAF) for evaluating military learning. However, these references rarely included engineering-specific equivalency guidance, and the extent to which military credit could satisfy engineering major requirements was generally unclear.

Civilian forms of prior technical learning were much less visible in published CPL policies. Nine of the ten institutions did not reference industry certifications, CTE pathways, or apprenticeships as recognizable forms of prior technical learning. Ohio State University was the only institution that published technician-related pathways through statewide articulation frameworks, including ITAG and CTAG. Portfolio or work-based assessment was also uncommon, appearing only in the policies of Penn State and Texas State. Arizona State and Oregon State explicitly excluded portfolio-based credit in their published policies.

Overall, published CPL policies provided more visible recognition pathways for standardized forms of learning, especially military learning, than for civilian hands-on technical learning documented through workplace experience, industry credentials, CTE participation, or apprenticeships. This does not mean that civilian technical learning lacks college-level value; rather, the published policies reviewed offered fewer clear mechanisms for evaluating and recognizing it.

RQ2: When prior technical learning is recognized in policy, how is credit applied within engineering degree structures?

The findings indicate that recognition of prior technical learning does not necessarily result in credit that supports progress through the engineering major. None of the ten institutions clearly showed how prior technical learning associated with non-degree technicians could count toward the required engineering major courses. Instead, published policy language typically described credit application as petition-based, department-determined, transfer-evaluated, or unspecified.

For military learning, institutions commonly identified ACE, JST, or CCAF as evaluation mechanisms, but they generally did not publish equivalencies for engineering courses. As a result, students may receive credit, but the policy does not clearly indicate whether that credit applies to major requirements, technical electives, general electives, or free electives.

Portfolio and work-based assessment followed a similar pattern. Although Penn State and Texas State recognized portfolio or work-based learning in published policy, the application of such credit depended on faculty or departmental review rather than published major-course mappings. Ohio State provided the most structured pathway for industry credentials and CTE

learning, but the published policy generally framed such credit as technical elective transfer credit, with engineering major applicability remaining unclear.

The evidence across the ten institutions shows that recognition alone does not guarantee progress through the engineering curriculum. Although some policies recognize prior technical learning, they rarely explain how that learning can count toward required engineering coursework. This makes credit application, not recognition alone, the main issue for non-degree technicians pursuing engineering degrees.

RQ3: What forms of evidence are recognized in published policy as documentation of prior technical learning associated with non-degree technicians?

Published CPL policies favored standardized and institutionally legible forms of evidence. Military transcripts evaluated through ACE, JST, or CCAF were the most frequently referenced evidence type, appearing in eight of the ten institutions' policies. These mechanisms provide documentation that is already familiar to colleges and universities, which may make military learning easier to evaluate within existing CPL systems.

By contrast, civilian evidence types associated with non-degree technicians were rarely addressed. Portfolio or work-based assessment appeared in only two policies. Industry certifications and CTE pathways appeared only in Ohio State's published policy, and registered apprenticeships were not explicitly referenced in any of the ten institutional policies reviewed. Non-military ACE or NCCRS pathways were referenced in only two institutional policies.

These findings suggest that published CPL policies are better positioned to recognize standardized, transcript-like, or externally evaluated evidence than broader forms of hands-on technical learning. For non-degree technicians, this means that prior technical learning may be difficult to convert into engineering-relevant credit unless it is documented through evidence forms that institutions already recognize as legitimate.

Discussion

This study examined how published CPL policies at ten institutions with ABET-accredited engineering programs recognize prior technical learning associated with non-degree technicians and specify whether credit for such learning can apply toward engineering degrees. The findings show that recognition is selective and uneven. Across the ten institutions, published policies were more likely to recognize learning documented through established credit-evaluation systems, especially military credit systems such as ACE, JST, and CCAF, than learning documented through industry credentials, CTE pathways, apprenticeships, or workplace-based experience.

This difference between military credit and civilian technical preparation matters because non-degree technicians may develop technical knowledge and skills without completing an engineering-related college degree. Their learning may be practical, hands-on, and workplace-based, and some of it may align with engineering learning outcomes. However, this learning is not always documented in forms that institutions readily recognize. The findings align with prior studies documenting inconsistent and discretionary CPL recognition across higher education [3],

[5], [19], [20]. They also reflect what Pitman and Vidovich [23] describe as credentialist calibration, where institutions determine the legitimacy of learning partly through the authority of the credentialing source. In this study, credentialism was visible because published policies gave more attention to military technical learning than to civilian technical preparation, which lacked similar validation systems.

Military learning was the most widely referenced form of prior technical learning in the published policies. This visibility may be explained by the presence of established evaluation systems such as ACE, JST, and CCAF, which translate military training into forms that higher education institutions can more easily process. However, recognition of military learning did not necessarily mean that the credit would apply toward required engineering coursework. As Ford and Ford [19] and Deickman et al. [5] note, military credit recognition is often inconsistent and may not extend to major requirements. The findings of this study support that concern: even where military learning was recognized, published policies rarely identified engineering-specific equivalencies.

The main policy problem, therefore, is not simply whether institutions recognize prior technical learning, but whether recognized learning helps students move through the engineering curriculum. None of the ten institutions clearly showed how prior technical learning associated with non-degree technicians could count toward required engineering coursework. Instead, policies often directed students toward petitions, departmental review, or transfer-credit evaluation without explaining how those processes would apply to industry credentials, CTE pathways, apprenticeships, or workplace-based learning. When policies recognize evidence but do not explain how credit can satisfy required coursework, recognition may remain symbolic rather than degree-advancing.

This finding echoes Richardson and Knight's [9] notion of earned credit as lost credit, where students may receive credit that does not accelerate time to degree. Similar concerns appear in broader transfer-credit research. Giani [17], for example, found that credit-application decisions can disadvantage learners whose prior academic or technical experiences do not fit traditional institutional pathways. In engineering, this issue may be especially consequential because curricula are often sequential, tightly structured, and governed by prerequisite chains. When engineering course equivalencies or major-course review processes are absent, prior technical learning that may be college-level may be limited to elective credit, general credit, or informal review.

The findings also show how credentialism can operate through policy. Apprenticeships, industry certifications, and CTE credentials may represent substantial hands-on learning, but published policies rarely identified them as recognizable evidence for CPL. Unlike military learning, these civilian forms of technical preparation often lack widely recognized systems that translate experience into college-credit recommendations. Consistent with credentialism [27], institutions may be more likely to recognize learning when a trusted external system has already validated it. For non-degree technicians, the barrier is not only whether they have relevant technical knowledge and skills, but whether the evidence they bring matches the documentation that CPL policies are prepared to recognize.

These patterns carry important equity implications. Non-degree technicians may include veterans, first-generation students, low-income learners, rural learners, and racially minoritized learners, many of whom may have limited time, financial resources, or institutional knowledge to navigate unclear credit-evaluation systems [6], [24], [26]. When published policies do not clearly explain how prior technical learning can be evaluated and applied to engineering major requirements, learners may face additional burdens in determining whether their knowledge and skills can count toward the degree. Because this study analyzes policy documents rather than student records, it cannot determine whether individual students were required to repeat coursework. However, the absence of published pathways for applying credit to required engineering coursework creates conditions under which repeated coursework, delayed degree completion, and additional costs may occur.

Although CPL has been associated with improved completion and financial outcomes [7], those benefits depend on whether awarded credit moves students toward degree completion. In this study, published CPL policies rarely showed how prior technical learning could satisfy required engineering coursework. The policies were more likely to acknowledge certain forms of prior learning than to show how that learning could advance students through the engineering curriculum. For technician-to-engineering pathways, the policy challenge is therefore not only expanding recognition, but ensuring that recognized learning can count where it matters most: toward required engineering coursework.

Limitations and Future Research

This study analyzed publicly available CPL policies from ten institutions with ABET-accredited engineering programs. Document analysis captures formal policy positions but not implementation. Institutions may rely on internal guidance, departmental practices, or case-by-case accommodations that are not visible in public documents, leaving policy-practice gaps unexamined. Coding was completed by a single coder, and ambiguous language required interpretive judgment despite consistency checks. The purposive sample prioritized geographic diversity rather than representativeness, limiting generalizability. The analysis also did not differentiate by engineering subdiscipline, which may matter because credit applicability may vary across programs with different curricular structures and accreditation expectations.

Future research should examine CPL in practice by tracking student navigation and outcomes, including petition success rates, actual credit application to major requirements, and how awarded credit affects progress through engineering curricula. Interviews with faculty, advisors, registrar staff, transfer-credit evaluators, and CPL administrators could clarify why certain evidence types are accepted, excluded, or limited to electives. Such studies could examine whether decisions are shaped by validity concerns, accreditation expectations, curricular sequencing, institutional identity, or uncertainty about how to evaluate hands-on technical learning. Longitudinal studies of engineering students receiving technical CPL would strengthen equity claims, especially because broader research links CPL to completion and financial outcomes [7], [8], [15], but engineering-specific evidence remains limited. Focused case studies of states with established frameworks, such as Ohio's ITAG/CTAG system, could also identify transferable strategies for enabling clearer and more major-applicable credit pathways.

Conclusion

Recent analyses of Credit for Prior Learning argue that effective CPL policy is fundamentally an equity issue, not only an efficiency concern [6]. For non-degree technicians pursuing engineering degrees, the findings of this study suggest that current recognition practices may operate as barriers when published policies do not clearly show how prior technical learning can be evaluated and applied to major requirements. In such cases, the burden of navigating credit recognition may shift onto learners whose knowledge and skills were developed outside traditional academic pathways.

In this study, prior technical learning associated with non-degree technicians was recognized unevenly and rarely connected to clear major-applicable pathways. Military learning was more visible because it was supported by standardized documentation systems, while civilian forms of hands-on technical learning, including industry credentials, apprenticeships, CTE pathways, and work-based learning, were less visible in published policy. These patterns suggest that CPL in engineering may function more as symbolic recognition than as a meaningful pathway into the major when recognized learning does not clearly support progress through required coursework.

CPL can function less as gatekeeping and more as an equity mechanism when recognition is transparent, consistent, and connected to degree requirements. In the context of efforts to diversify engineering and strengthen workforce pathways, clearer recognition of industry certifications, apprenticeships, CTE credentials, and other forms of validated hands-on learning could reduce uncertainty and support stronger technician-to-engineering pathways. Moving from policy recognition to major-applicable pathways will require coordinated effort among engineering programs, institutional leaders, states, and credentialing bodies.

Reference

[1] R. Klein-Collins, J. Taylor, C. Bishop, P. Bransberger, P. Lane, and S. Leibrandt, “The PLA Boost: Results from a 72-Institution Targeted Study of Prior Learning Assessment and Adult Student Outcomes.,” *Counc. Adult Exp. Learn.*, 2020.

[2] N. Travers, “United States of America: Prior Learning Assessment (PLA) research in colleges and universities,” *Res. Recognit. Prior Learn. Int. Perspect.*, 2011.

[3] C. A. Cherrstrom, C. J. Boden, T. Sherron, and L. Wilson, “Decade of prior learning assessment in the United States: A systematic literature review,” *J. Contin. High. Educ.*, vol. 70, no. 2, pp. 88–104, 2022.

[4] T. Stenlund, “Assessment of prior learning in higher education: A review from a validity perspective,” *Assess. Eval. High. Educ.*, vol. 35, no. 7, pp. 783–797, 2010.

[5] J. Deickman, J. Mattox, and P. A. Morris, “Credit for military service in Colorado: A case study,” *New Dir. Community Coll.*, vol. 2024, no. 206, pp. 39–52, 2024.

[6] M. C. Soler, R. Klein-Collins, E. Swirsky, K. Seidel, and R. Hirsch, “The national landscape of credit for prior learning: Effective state and system policies for success and equity,” *Am. Counc. Educ.*, 2024.

[7] A. Boatman, M. Hurwitz, J. Lee, and J. Smith, “The impact of prior learning assessments on college completion and financial outcomes,” *J. Hum. Resour.*, vol. 55, no. 4, pp. 1161–1193, 2020.

[8] M. S. Hayward and M. R. Williams, “Adult learner graduation rates at four US community colleges by prior learning assessment status and method,” *Community Coll. J. Res. Pract.*, vol. 39, no. 1, pp. 44–54, 2015.
[9] A. J. Richardson and D. B. Knight, “Earned Credit Could be Lost Credit,” *AERA Open*, vol. 10, p. 23328584241289377, 2024.
[10] R. Klein-Collins, “PLA Data Tracking: Proposing a Model for Institutional Tracking and Reporting of Credit Earned through Prior Learning Assessment.,” *Counc. Adult Exp. Learn.*, 2016.
[11] C. J. Boden, C. A. Cherrstrom, T. Sherron, M. Mohamed, L. Wilson, and K. Pomeroy, “A decade of global prior learning assessment: A systematic literature review,” *J. Contin. High. Educ.*, vol. 72, no. 1, pp. 104–121, 2024.
[12] C. Brigham and R. Klein-Collins, “Going online to make learning count,” *Int. Rev. Res. Open Distrib. Learn.*, vol. 12, no. 1, pp. 139–143, 2011.
[13] B. Eynon, L. M. Gambino, and J. Török, “What Difference Can ePortfolio Make? A Field Report from the Connect to Learning Project.,” *Int. J. EPortfolio*, vol. 4, no. 1, pp. 95–114, 2014.
[14] C. F. Nguyen, “The ePortfolio as a Living Portal: A Medium for Student Learning, Identity, and Assessment.,” *Int. J. EPortfolio*, vol. 3, no. 2, pp. 135–148, 2013.
[15] D. Z. Rust and W. L. Ikard, “Prior learning assessment portfolio completion: Improved outcomes at a public institution,” *J. Contin. High. Educ.*, vol. 64, no. 2, pp. 94–100, 2016.
[16] K. Stevens, D. Gerber, and R. Hendra, “Transformational learning through prior learning assessment,” *Adult Educ. Q.*, vol. 60, no. 4, pp. 377–404, 2010.
[17] M. S. Giani, “The correlates of credit loss: How demographics, pre-transfer academics, and institutions relate to the loss of credits for vertical transfer students,” *Res. High. Educ.*, vol. 60, no. 8, pp. 1113–1141, 2019.
[18] M. Hodara, M. Martinez-Wenzl, D. Stevens, and C. Mazzeo, “Improving credit mobility for community college transfer students,” *Plan. High. Educ.*, vol. 45, no. 1, pp. 51–116, 2016.
[19] J. C. Ford and G. D. Ford, “Articulation of military earned college credit into the University of North Carolina University System,” presented at the 2017 ASEE Annual Conference & Exposition, 2017.
[20] B. J. Novoselich, J. L. Hall, K. A. Landry, J. B. Main, and A. W. Dean, “Supporting veteran students along engineering pathways: Faculty, student, and researcher perspectives,” presented at the 2017 ASEE Annual Conference & Exposition, 2017.
[21] ABET, "Criteria for Accrediting Engineering Programs, 2025-2026," ABET Engineering Accreditation Commission, Baltimore, MD, 2025. [Online]. Available: https://www.abet.org/accreditation/accreditation-criteria/
[22] S. Engelage, C. Baumeler, P. Salzmann, and C. Hämmerli, “Anrechnung von Bildungsleistungen in der höheren Berufsbildung. Rahmenbedingungen und Anrechnungspraxis an Höheren Fachschulen in der Schweiz,” *Z. Für Weiterbildungsforschung*, vol. 47, no. 2, pp. 403–423, 2024.
[23] T. Pitman and L. Vidovich, “Recognition of prior learning (RPL) policy in Australian higher education: The dynamics of position-taking,” *J. Educ. Policy*, vol. 27, no. 6, pp. 761–774, 2012.
[24] M. J. Bergman and S. McCaskey, “An examination of prior learning assessment participation and guidance at four-year universities,” *PLA Int. J. Theory Res. Pract. Prior Learn. Assess.*, no. 7, 2019.

[25] K. C.-D. Cruz, “Strengthening Assessment in the Expanded Tertiary Education Equivalency and Accreditation Program: Best Practices, Challenges, and Policy Directions for Evidence-Based Reform,” *Int. J. Learn. Teach. Educ. Res.*, vol. 24, no. 7, pp. 869–896, 2025.
[26] A. ., vol. no. pp. 27] R. Collins, “The Credential Society,” in *An Historical Sociology of Education and Stratification*, Columbia University Press, 2019, pp. 174–241. doi: 10.7312/coll19234-009.

[1]Anderson Keah, Florida International University, Department of Eng Comp Educ Systems & Mgmt, akeah001@fiu.edu

[2]Dr. Burk Berhane, Florida International University, Department of Eng Comp Educ Systems & Mgmt, bberhane@fiu.edu

[3]Daniel I. Adeniranye, Florida International University,Eng Comp Educ Systems & Mgmt, daden002@fiu.edu

1
2
3