



INTEGRATING PROBLEM-BASED LEARNING INTO CREDIT-MODULE SYSTEMS TO ENHANCE INDEPENDENT LEARNING COMPETENCIES: EVIDENCE FROM ENGLISH LANGUAGE AND LITERATURE PROGRAMMES IN UZBEKISTAN

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Abstract

The integration of Problem-Based Learning (PBL) within credit-module educational frameworks has attracted considerable scholarly attention as higher education institutions across Central Asia undergo systemic reform [1.12]. This study investigates the effects of PBL implementation on independent learning competencies among undergraduate students enrolled in English Language and Literature programmes at three higher education institutions in Uzbekistan. Employing a mixed-methods design, the study involved 184 participants across two academic years (2022–2024). Quantitative data were collected through validated autonomy and self-regulation scales, while qualitative data were gathered through semi-structured interviews and reflective portfolios. Findings indicate that PBL-integrated credit-module courses significantly improved students' metacognitive awareness, self-directed task engagement, and critical thinking in English language learning contexts [8.236]. Statistical analysis revealed a mean pre-post gain of 18.3 points on the Learner Autonomy Index ($p < 0.001$). The study discusses these outcomes in relation to Uzbekistan's ongoing higher education reforms and situates findings within global PBL literature. Practical recommendations for curriculum designers and faculty developers in EFL/ELL contexts are provided.

Keywords: Problem-based learning; credit-module system; independent learning; learner autonomy; English Language and Literature; Uzbekistan; higher education reform; EFL pedagogy.



Introduction

The landscape of higher education in Uzbekistan has undergone profound transformation since the adoption of the National Strategy for Educational Development 2021–2026, which explicitly mandates a shift from teacher-centred instruction towards student-centred, competence-based approaches [1.34]. Within this transformative context, the credit-module system – introduced comprehensively into Uzbek universities by governmental decree in 2018 – serves as the structural backbone for curriculum organisation, requiring that learning outcomes be measurable, modular, and amenable to flexible scheduling [2.8]. Yet structural reform alone does not guarantee pedagogical renewal. A persistent challenge identified by multiple Uzbek educational researchers is that the credit-module framework, although architecturally sound, frequently coexists with lecture-dominated delivery methods that do not cultivate the independent learning skills the system was designed to nurture [3.47].

Independent learning – encompassing learner autonomy, self-regulation, metacognitive monitoring, and intrinsic motivation – has been recognised internationally as a critical graduate competency, particularly in language education [4.18]. For students of English Language and Literature, the capacity for self-directed inquiry is not merely a pedagogical ideal but a professional necessity, given the communicative and interpretive demands of the discipline. Despite this, recent studies conducted within Uzbek universities reveal that a significant proportion of English Language and Literature undergraduates report low levels of autonomous study behaviour, reliance on instructor-provided resources, and limited engagement with authentic English-language materials outside class hours [5.92] [6.15].

Problem-Based Learning (PBL), originally developed in medical education at McMaster University in the 1960s [7.481] and subsequently adapted across disciplines, presents a theoretically grounded and empirically tested response to this challenge. By situating learners in ill-structured, authentic problem scenarios that require collaborative investigation and self-directed knowledge construction, PBL inherently demands the exercise of the very competencies that Uzbek higher education reform seeks to develop [8.237]. However, the integration of PBL into credit-module systems introduces particular logistical and pedagogical tensions: module boundaries must accommodate iterative problem cycles, assessment rubrics



must capture process as well as product, and faculty must be prepared for facilitative rather than transmissive roles [9.11].

The body of Uzbek-language scholarship addressing these intersections remains comparatively slender. Jalolov [10.45], whose foundational work on foreign language teaching methodology has shaped several generations of Uzbek English teachers, underscored the importance of developing critical thinking and communicative competence through active learning; yet his framework predates the credit-module era and does not specifically theorise PBL integration. More recently, Mirzayeva [11.58] examined self-directed learning dispositions among pedagogical university students and identified significant variation correlated with institutional culture and faculty modelling. Ismatova [12.38] contributed an empirically grounded study of cooperative learning strategies in Uzbek EFL classrooms, demonstrating that structured peer interaction improves both linguistic and cognitive outcomes. These works collectively indicate a receptive scholarly environment for PBL research, while simultaneously revealing a gap: no study has systematically examined PBL implementation within the credit-module framework specifically for English Language and Literature students across multiple Uzbek institutions.

The present study addresses this gap. Drawing on theoretical frameworks from Barrows [7.482], Hmelo-Silver [8.240], and Boud and Feletti [13.16], and situating findings within the Uzbek higher education policy context, we investigate the following research questions:

RQ1: Does PBL integration within credit-module English Language and Literature courses produce statistically significant gains in students' independent learning competencies compared with conventional instruction?

RQ2: What qualitative mechanisms do students and instructors identify as mediating the relationship between PBL participation and autonomous learning behaviour?

RQ3: What institutional and curricular factors facilitate or impede effective PBL implementation in Uzbek credit-module contexts?

MATERIALS AND METHODS

Study Design and Setting. A convergent mixed-methods design [14.67] was employed, combining pre-test–post-test quasi-experimental measurement with embedded qualitative inquiry. The research was conducted at three higher education institutions in Uzbekistan: Uzbek State World Languages University (UzSWLU) in



Tashkent, Tashkent State Pedagogical University (TSPU), and the Institute of Foreign Languages (IFL). These institutions were selected on the basis of their established English Language and Literature degree programmes, their formal adoption of the credit-module system, and their institutional willingness to participate in pedagogical research. Ethical approval was granted by the Research Ethics Committee of UzSWLU (Protocol No. 14/2022, dated 5 September 2022). Written informed consent was obtained from all participants.

Participants. A total of 184 undergraduate students enrolled in second- and third-year English Language and Literature courses participated in the study across two academic years (2022–2024). Participants were allocated to two conditions: an experimental group ($n = 94$) whose courses incorporated PBL modules, and a control group ($n = 90$) who received conventional lecture-seminar instruction on equivalent content. Additionally, 18 faculty members involved in the delivery of these courses participated in semi-structured interviews. The mean age of student participants was 20.3 years ($SD = 1.4$); 68% identified as female and 32% as male, broadly reflecting the gender distribution of English Language and Literature programmes in Uzbekistan. No significant baseline differences between groups were detected on the Learner Autonomy Index (LAI) or on prior academic achievement scores ($p > 0.05$).

Intervention: PBL Within the Credit-Module Framework. The PBL intervention was designed in accordance with the seven-jump method [15.694] and adapted for the credit-module context by embedding problem cycles within module credit hours. Each module (equivalent to 3 ECTS credits) incorporated two PBL cycles of approximately three weeks each. Problems were constructed to be contextually authentic for English Language and Literature students: examples included analysing language policy shifts in post-independence Uzbekistan, critically evaluating translated Uzbek literary works for cultural fidelity, and designing a community literacy campaign for a specific demographic. These scenarios required participants to identify learning issues, pursue self-directed research using English-language academic sources, collaborate in small groups (4–5 members), and present evidence-based solutions. Faculty underwent a 40-hour preparatory workshop on PBL facilitation prior to the intervention commencement.

Instruments. Quantitative data were collected using: (a) the Learner Autonomy Index (LAI), a 32-item validated scale assessing self-direction, metacognitive monitoring, resource management, and motivational self-regulation (Cronbach's $\alpha = 0.89$)



[16.353]; (b) the Self-Regulated Learning Scale adapted for EFL contexts [17.5] ($\alpha = 0.86$); and (c) module examination scores as a proxy for academic achievement. Instruments were translated into Uzbek and Russian by bilingual research assistants, with back-translation verification. Qualitative data were gathered through semi-structured interviews (30–45 minutes per participant) and student reflective portfolios compiled at the end of each PBL cycle. Interviews were audio-recorded with consent, transcribed verbatim, and translated into English for analysis.

Data Analysis. Quantitative data were analysed using IBM SPSS Statistics 27. Paired-samples t-tests examined pre-post change within each group; independent-samples t-tests and ANCOVA (controlling for baseline LAI scores) compared groups at post-test. Effect sizes were calculated using Cohen's *d*. Qualitative data were analysed thematically following Braun and Clarke's six-phase framework [18.82], with coding performed in NVivo 14. Triangulation was achieved by cross-referencing quantitative findings with qualitative themes. Statistical significance was set at $p < 0.05$.

RESULTS

Gains in Learner Autonomy Index Scores. At baseline, the experimental and control groups did not differ significantly on LAI scores (experimental: $M = 61.4$, $SD = 9.2$; control: $M = 62.1$, $SD = 8.7$; $t(182) = 0.47$, $p = 0.64$). Following the two-year intervention, the experimental group demonstrated a mean LAI gain of 18.3 points ($M_{\text{post}} = 79.7$, $SD = 7.8$), compared with a gain of 4.1 points in the control group ($M_{\text{post}} = 66.2$, $SD = 9.1$). The between-group difference at post-test was statistically significant ($t(182) = 10.84$, $p < 0.001$, $d = 1.59$), indicating a large effect size. ANCOVA controlling for baseline LAI yielded a similar result, $F(1, 181) = 108.7$, $p < 0.001$, $\eta^2 = 0.37$.

Subscale analysis revealed that the largest gains in the experimental group occurred on the metacognitive monitoring subscale (gain = 5.9 points, $d = 1.71$) and the self-directed resource engagement subscale (gain = 4.8 points, $d = 1.43$). Motivational self-regulation also improved significantly (gain = 3.7 points, $d = 1.12$). These patterns suggest that PBL's effect on learner autonomy operates primarily through enhanced metacognitive awareness and deliberate resource-seeking behaviour, consistent with theoretical accounts by Hmelo-Silver [8.250] and empirical findings by Dochy et al. [19.545].



Self-Regulated Learning Scale Outcomes. On the Self-Regulated Learning Scale, the experimental group improved from $M = 58.3$ ($SD = 10.1$) to $M = 74.9$ ($SD = 8.6$) post-intervention (gain = 16.6 points, $t(93) = 14.2$, $p < 0.001$, $d = 1.75$). The control group showed a modest improvement from $M = 57.9$ to $M = 62.7$ (gain = 4.8 points), which did not reach significance at post-test comparison after Bonferroni correction. The magnitude of the experimental group's improvement aligns with findings reported by Schmidt et al. [20.564] in European PBL contexts, suggesting cross-cultural robustness of the PBL effect on self-regulated learning.

Academic Achievement. Module examination scores showed a moderate advantage for the experimental group ($M = 76.4$, $SD = 8.9$) relative to the control group ($M = 70.1$, $SD = 10.2$) at post-intervention ($t(182) = 4.11$, $p < 0.001$, $d = 0.66$). This finding must be interpreted cautiously, as the examinations used by different instructors were not fully standardised; however, the directional consistency across all three participating institutions lends credibility to the result.

Qualitative Findings. Thematic analysis of interview transcripts and reflective portfolios generated four principal themes. First, 'Encountering Productive Uncertainty': students described initial disorientation when confronted with open-ended problems, which gradually transformed into confident independent inquiry. One third-year student at UzSWLU wrote: "At first I did not know where to start. But after the second cycle I began to search for books and articles myself without waiting for the teacher to tell me." This trajectory resonates with Savery's [21.33] characterisation of PBL-induced epistemic discomfort as a driver of autonomous knowledge construction.

Second, 'Faculty as Facilitators, Not Authorities': faculty interviews revealed significant attitudinal shifts. Several instructors acknowledged that their initial resistance to relinquishing content delivery was gradually replaced by appreciation for the quality of student-generated questions. One instructor at TSPU noted that students began consulting sources she had not assigned, including recent issues of *ELT Journal* and *Applied Linguistics*, reflecting an expansion of disciplinary engagement that conventional teaching had not produced.

Third, 'Language as a Tool for Inquiry': PBL problems requiring English-medium research compelled students to engage with authentic academic discourse, improving both reading comprehension and academic writing in ways that isolated grammar instruction had not achieved. This aligns with Ismatova's [12.44] finding that



purposeful English-language task engagement produces more durable linguistic gains than decontextualised exercises.

Fourth, ‘Institutional Friction’: both students and faculty identified structural constraints that partially impeded PBL implementation. These included rigid credit-hour scheduling that fragmented problem cycles, assessment regulations requiring individual graded outputs that complicated group-process evaluation, and insufficient library access to English-language databases. These findings echo concerns raised by Mirzayeva [11.64] regarding the mismatch between innovative pedagogical intentions and institutional support structures in Uzbek universities.

DISCUSSION

Principal Findings and Their Significance. The central finding of this study is unambiguous: PBL integration within credit-module English Language and Literature courses produced substantial, statistically significant, and practically meaningful improvements in students’ independent learning competencies over a two-year period. The effect size for the LAI ($d = 1.59$) exceeds thresholds commonly associated with transformative educational interventions and is broadly consistent with meta-analytic estimates of PBL effectiveness reported by Dochy et al. [19.553] ($d = 0.70$ for knowledge application) and Gijbels et al. [22.45] ($g = 0.82$ for higher-order cognition), though our larger effect may partially reflect the contextual specificity of our instrument and the extended duration of the intervention.

These results carry particular significance for Uzbekistan. Jalolov [10.52], writing foundationally on foreign language teaching methodology, argued that the ultimate aim of language education is not the transmission of rules but the cultivation of communicative agency — a goal that, we contend, is structurally supported by PBL. Our findings provide empirical evidence that Jalolov’s aspirations can be operationalised within the contemporary credit-module system, provided that implementation is sufficiently resourced and sustained. Mirzayeva’s [11.61] observation that self-directed learning dispositions in Uzbek students are shaped by institutional culture gains concrete support from our qualitative findings: where faculty modelled facilitative behaviour and where institutional structures accommodated iterative inquiry, students’ autonomous learning flourished; where these conditions were absent, development was constrained.



Unexpected Findings. Two findings were not anticipated in the original theoretical framework. First, the differential magnitude of gains across subscales — with metacognitive monitoring showing the largest improvement — suggests that PBL’s primary mechanism of action in this context is not motivational enhancement but epistemic habit formation: students learned to monitor their own understanding and to identify the boundaries of their knowledge. This finding challenges a dominant narrative in the Uzbek educational reform discourse, which has emphasised motivational strategies as the key to learner autonomy, and redirects attention towards explicit metacognitive scaffolding as a complementary intervention.

Second, the degree to which PBL stimulated voluntary engagement with English-language academic literature — documented both quantitatively (resource engagement subscale) and qualitatively (faculty and student testimony) — was greater than anticipated. This suggests that authentic problem scenarios exercise a powerful pull function on language learners that traditional task design, oriented around linguistic objectives rather than epistemic ones, does not achieve. This finding extends Ismatova’s [12.47] work by demonstrating that the benefits of cooperative, purpose-driven engagement are amplified when the purpose itself is disciplinarily meaningful rather than pedagogically manufactured.

Comparison with International Literature. The present results are consonant with a substantial body of international PBL research. Hmelo-Silver [8.252] demonstrated that PBL learners develop richer and more flexibly applicable knowledge structures than their lecture-taught counterparts; our achievement data are consistent with this pattern. Schmidt et al.’s [20.566] longitudinal study of PBL medical graduates found that PBL alumni reported higher levels of lifelong learning engagement two decades post-graduation — a finding that underscores the durational relevance of the present intervention. Van Merriënboer and Kirschner [23.112], while cautioning against minimally guided instruction, identified the conditions under which PBL’s cognitive load is productively managed: sufficient prior knowledge, clear problem structure, and expert facilitation. Our qualitative findings confirm that these conditions, when present, enabled students to navigate uncertainty productively, and when absent, produced frustrated passivity.

The specific context of English as a Foreign Language (EFL) instruction adds nuance. Rhem [24.2] and more recently Lee and Jiang [25.47] have noted that PBL in EFL settings must negotiate the dual demand of language development and content



mastery. Our data suggest that, at least for advanced undergraduates in an English-medium discipline, this dual demand operates synergistically rather than competitively: disciplinary inquiry in English both motivates language engagement and provides authentic contexts for vocabulary, genre, and rhetorical skill development.

Limitations. Several limitations must be acknowledged. The quasi-experimental design, necessitated by the impossibility of random assignment within intact institutional structures, means that unmeasured pre-existing differences between groups cannot be fully excluded despite the absence of significant baseline differences. The three participating institutions, while diverse in their profiles, are all located in Tashkent, which limits generalisability to regional universities with fewer resources. Faculty participation in the preparatory workshop may have introduced a Hawthorne effect, with instructors performing more thoughtfully than they otherwise would. Finally, the LAI and Self-Regulated Learning Scale, although validated and adapted for the Uzbek context, were originally developed in Western educational settings; further validation studies specific to Central Asian learner populations would strengthen the evidential base.

Generalisability and Implications for Policy and Practice. Notwithstanding these limitations, the consistency of findings across three institutions, two cohorts, and both quantitative and qualitative strands supports cautious generalisation to comparable English Language and Literature programmes in Uzbekistan and analogous Central Asian credit-module contexts. For curriculum designers, the findings argue for the deliberate embedding of two-to-three-week PBL cycles within existing module structures, with attention to providing authentic problems that draw on disciplinary content rather than generic scenarios. For faculty developers, the data underscore the necessity of sustained facilitation training rather than one-off workshops: attitudinal change, as our qualitative findings reveal, is gradual and requires ongoing reflective support [9.17]. For institutional leaders, the study identifies library access to English-language academic databases and flexible credit-hour scheduling as enabling conditions that must be actively ensured.

At the policy level, the findings offer evidence-based support for the ongoing implementation of student-centred pedagogies within the 2021–2026 National Strategy for Educational Development [1.38]. The recommendation here is not to mandate PBL wholesale, but to create incentive structures — revised quality



assurance criteria, professional development funding, assessment regulation amendments — that make PBL implementation feasible and rewarded rather than structurally penalised.

CONCLUSION

This study demonstrates that the integration of Problem-Based Learning into credit-module English Language and Literature courses in Uzbekistan produces significant and durable gains in students' independent learning competencies, particularly in metacognitive monitoring and self-directed resource engagement. These gains, triangulated across quantitative and qualitative data sources and consistent with international PBL literature, are attributable to PBL's demand for authentic inquiry, collaborative problem-solving, and iterative self-assessment — processes that the credit-module framework can accommodate when deliberately redesigned to support them. The present findings build on the foundational contributions of Jalolov [10.48], Mirzayeva [11.66], and Ismatova [12.50] while extending the empirical evidence base into the underexplored intersection of PBL and credit-module pedagogy in Central Asian EFL higher education. Future research should examine the sustainability of autonomy gains over time, the differential effects of PBL across year groups and proficiency levels, and the mechanisms by which institutional culture moderates implementation quality.

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