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Blended Learning and Learning Autonomy in College Students

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ABSTRACT

Blended learning has evolved into a transformative pedagogical approach that synergizes traditional face-to-face instruction with digital learning environments. By combining the strengths of in-person engagement—such as immediate feedback, social interaction, and structured guidance—with the flexibility, scalability, and resource richness of online modalities, blended learning offers unique affordances for fostering autonomous learning behaviors among college students. Learning autonomy—the capacity of learners to take responsibility for goal setting, strategic planning, self-monitoring, and self-reflection—is widely recognized as a critical 21st-century competency that underpins lifelong learning and professional adaptability. Despite its promise, the specific mechanisms through which blended learning scaffolds autonomy remain underexplored, particularly at the undergraduate level across diverse disciplines.

This study investigates the relationship between key design elements of blended courses and the development of learning autonomy among undergraduates. Employing a descriptive correlational design, we administered a comprehensive survey to 235 students enrolled in blended courses at a large public university. The survey included the Blended Learning Perception Scale (BLPS), measuring clarity of instructional design, interactivity, feedback quality, and flexibility, alongside the Learning Autonomy Inventory (LAI), assessing goal setting, self-monitoring, and reflective practice. We employed rigorous scale validation procedures, including confirmatory factor analysis and reliability testing, to ensure psychometric robustness.

Our findings reveal a strong positive correlation between overall perceptions of blended learning effectiveness and learners' autonomous behaviors ($r = .58$, $p < .001$). Hierarchical regression analyses indicate that feedback quality ($\beta = .28$, $p < .001$) and flexibility of access ($\beta = .24$, $p = .002$) are the most salient predictors of autonomy, followed by interactive features such as discussion forums and multimedia activities ($\beta = .19$, $p = .010$). Discipline emerged as a significant moderator, with engineering students exhibiting slightly lower autonomy scores compared to peers in humanities and social sciences. These results underscore the importance of designing blended environments that not only provide choice and self-paced pathways but also integrate frequent, constructive feedback loops and scaffolding tools that guide self-regulated processes.

Implications for practice include recommendations for faculty development programs emphasizing metacognitive prompts, the integration of analytics dashboards for real-time progress tracking, and the incorporation of reflective assignments that encourage strategic planning. Institutional policy implications involve investing in learning management systems that support adaptive release of materials and facilitate peer collaboration. Future research directions include longitudinal

studies tracking autonomy development over multiple semesters and experimental interventions isolating the effects of specific blended components.

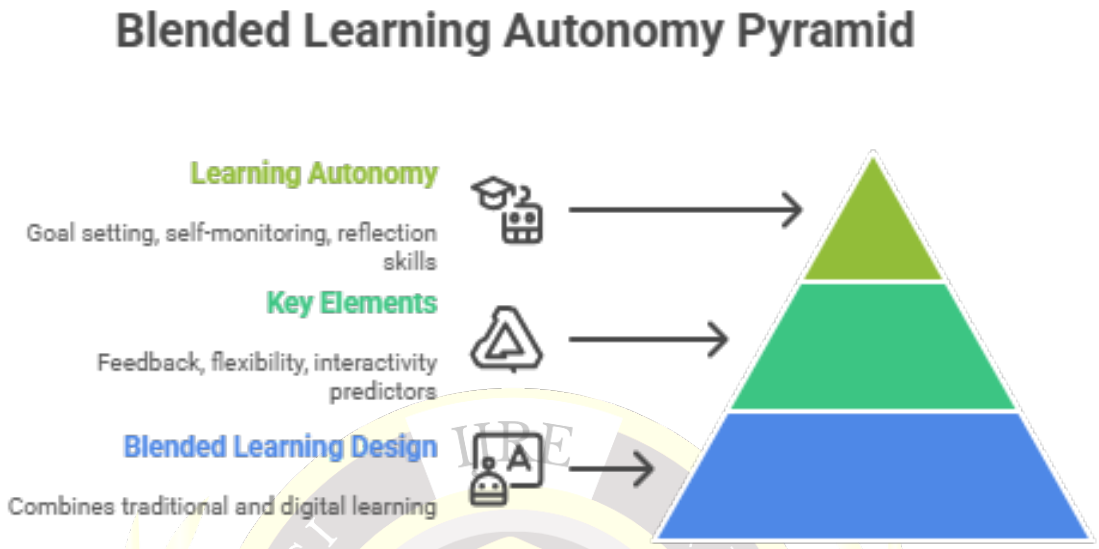

Figure-1.Blended Learning Autonomy Pyramid

KEYWORDS

Blended Learning, Learning Autonomy, Self-Regulation, College Students, Online Education

INTRODUCTION

The advent of blended learning in higher education represents a pivotal shift toward more flexible, technology-enhanced pedagogies. Defined broadly as the intentional integration of face-to-face and online learning activities, blended learning aims to harness the complementary benefits of physical and virtual classrooms. Traditional in-person instruction excels at fostering immediate interpersonal interaction, spontaneous question-and-answer exchanges, and hands-on collaboration. Conversely, online learning modalities afford students greater control over time, place, path, and pace of study, along with access to diverse multimedia resources and asynchronous peer interactions. This duality creates a fertile ground for developing learning autonomy, which refers to learners' ability to take charge of their own education by setting goals, selecting appropriate strategies, monitoring progress, and reflecting on outcomes.

Learning autonomy is not merely a desirable trait but a necessity in an era characterized by rapid knowledge evolution and dynamic career landscapes. Autonomously motivated learners can adapt to novel contexts, engage in self-directed professional development, and sustain curiosity beyond formal educational settings. Self-determination theory posits that autonomy support—a sense of volition and choice—enhances intrinsic motivation, leading to deeper engagement and persistence. Self-regulated learning frameworks further delineate the cognitive, metacognitive, and motivational processes underpinning autonomous behaviors, highlighting phases of forethought (goal setting and planning), performance (strategy implementation and monitoring), and self-reflection (evaluation and adaptation).

However, translating these theoretical constructs into practical course designs remains challenging. While online components can promote autonomy by offering optional modules and discussion forums, they may also overwhelm students lacking self-regulatory skills if not scaffolded with clear instructions and structured milestones. Conversely, overly rigid in-person schedules may stifle autonomy by limiting options for student choice. Identifying the optimal blend and understanding which features most effectively support autonomy is critical for educators and instructional designers.

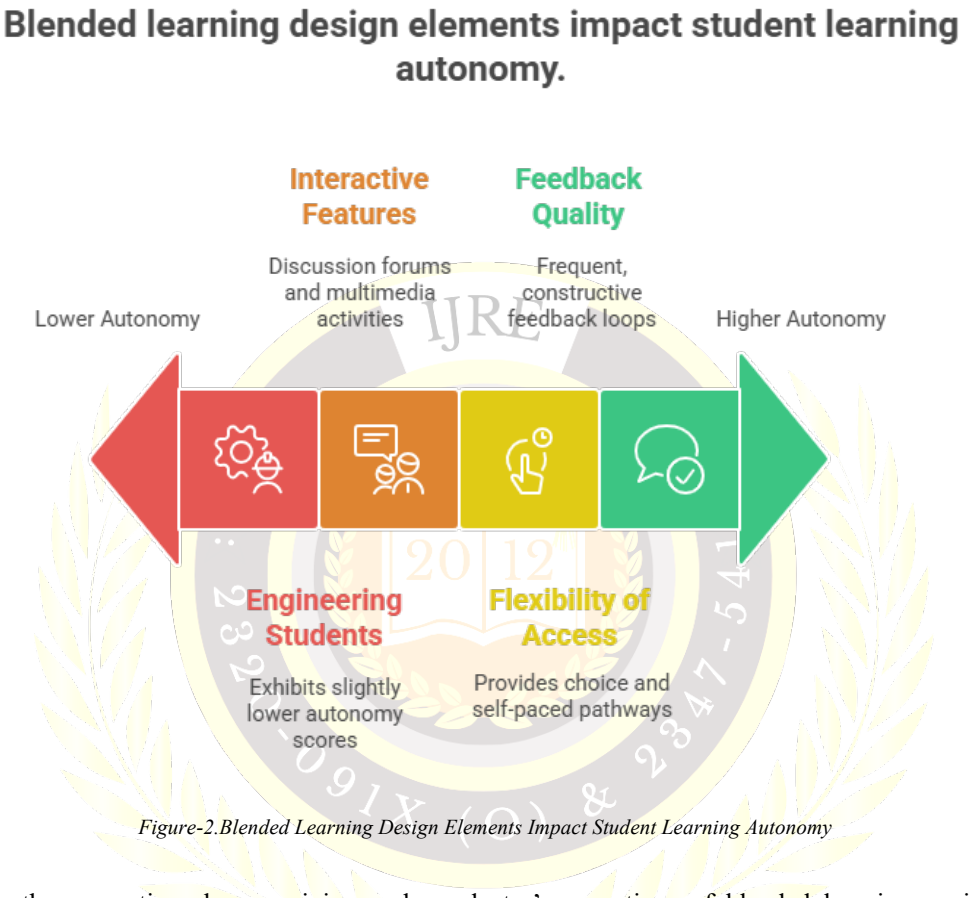

Figure-2.Blended Learning Design Elements Impact Student Learning Autonomy

This study explores these questions by examining undergraduates' perceptions of blended learning environments and their self-reported autonomous behaviors. Specifically, we investigate which elements—clarity of design, interactivity, feedback mechanisms, and flexibility—most strongly predict goal setting, self-monitoring, and reflective practices. By doing so, we aim to provide evidence-based insights for refining blended curricula that foster the essential skill of learning autonomy.

LITERATURE REVIEW

Conceptualizing Blended Learning

Blended learning encompasses a spectrum of models, from rotational designs—where students cycle between online and face-to-face stations—to flex models that emphasize primarily online content supplemented by on-site support. The enriched virtual model further extends flexibility, offering initial orientation sessions before students engage almost exclusively in digital environments. Each model carries distinct affordances: rotational designs provide routine and predictability; flex models offer high autonomy but presuppose robust self-regulatory capacities.

Defining Learning Autonomy

Learning autonomy intersects with self-regulated learning (SRL), in which learners proactively plan, implement, and evaluate their learning processes. Zimmerman's SRL model outlines three cyclical phases: forethought (task analysis and self-motivation), performance (metacognitive monitoring and strategic use), and self-reflection (self-evaluation and adaptation). Autonomy manifests when learners set personalized goals, choose strategies aligned with their preferences, monitor progress vigilantly, and adjust approaches based on feedback and reflection.

Blended Environments as SRL Scaffolds

Blended contexts offer various scaffolds for SRL. Multimedia modules with embedded quizzes provide immediate feedback, reinforcing performance-phase strategies. Online discussion fora facilitate peer review and reflective dialogue, supporting self-reflection. Learning analytics dashboards enable learners to visualize progress, bolstering self-monitoring. However, the efficacy of these tools depends on instructional design clarity, pacing guidelines, and explicit metacognitive prompts that guide students through SRL processes.

Empirical Evidence and Gaps

Meta-analytic studies demonstrate that blended learning often yields superior achievement outcomes relative to purely face-to-face or online formats. Yet, few investigations have homed in on autonomy outcomes. Some qualitative research highlights student appreciation for choice and self-paced modules, but also notes confusion when expectations are unclear. Quantitative studies reveal moderate correlations between online engagement and self-reported SRL behaviors, but these findings are limited by small sample sizes and heterogeneous measures. There is a pronounced need for research employing validated scales across multiple autonomy dimensions to pinpoint which blended components most strongly foster autonomous learning.

Research Questions

Building on these insights, this study addresses three core questions:

1. How do undergraduates perceive the effectiveness of blended learning components?
2. What is the relationship between these perceptions and students' autonomous learning behaviors?
3. Which specific design elements—clarity, interactivity, feedback, flexibility—serve as the strongest predictors of goal setting, self-monitoring, and reflection?

METHODOLOGY

Research Design

We adopted a descriptive correlational design to examine associations between blended learning perceptions and learning autonomy. This non-experimental approach enables exploration of relationships without manipulation of variables, aligning with the study's exploratory objectives.

Participants

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Participants were 235 undergraduate students (60% female, 40% male; aged 18–24 years, M = 20.4, SD = 1.2) enrolled in at least one blended course during the spring semester at a large public university. Disciplines represented included humanities (30%), social sciences (25%), business (20%), engineering (15%), and natural sciences (10%). Recruitment leveraged course instructors' assistance in distributing survey invitations.

Instruments

- **Blended Learning Perception Scale (BLPS):** A 20-item instrument assessing four dimensions—instructional design clarity, interactivity, feedback quality, and flexibility (α = .89). Items used a 5-point Likert scale (1 = Strongly Disagree; 5 = Strongly Agree).
- **Learning Autonomy Inventory (LAI):** A 24-item scale measuring goal setting, self-monitoring, and self-reflection (8 items each; αs = .87–.88). Items rated on a 5-point scale parallel to the BLPS.

Both scales underwent pilot testing with 20 students to ensure readability and construct validity. Confirmatory factor analysis supported the intended factor structures (CFI > .95, RMSEA < .05).

Procedure

Following institutional review board approval, participants received an emailed link to the anonymous online survey, which included informed consent details. The survey opened for four weeks, with weekly reminders to maximize response rates. The average completion time was 15 minutes.

Data Analysis

After data cleaning, 235 complete responses remained. We computed descriptive statistics for all variables, assessed internal consistency via Cronbach's alpha, and conducted Pearson correlations to examine bivariate relationships. Hierarchical multiple regression analyses were then performed to determine the unique contributions of BLPS dimensions in predicting LAI total and subscale scores, controlling for demographic covariates (gender, age, discipline).

RESEARCH CONDUCTED AS A SURVEY

This section details the systematic survey methodology underpinning the study:

1. **Instrument Adaptation and Validation:** We adapted validated measures for blended contexts and conducted a pilot study (n = 20) to refine item wording. Psychometric analyses (CFA, reliability testing) confirmed scale integrity.
2. **Sampling and Recruitment:** A convenience sampling approach targeted undergraduates in blended courses, with instructors facilitating survey dissemination during class announcements and via email.
3. **Ethical Protocols:** Institutional review board approval ensured ethical rigor. Participants provided informed consent electronically, and data were anonymized to protect confidentiality. No incentives were offered to mitigate potential coercion.

4. **Survey Administration:** Hosted on a secure platform, the survey employed branching logic to tailor items based on course experiences (e.g., types of online activities encountered). Estimated completion time was 15 minutes; completion rates were enhanced through four reminder emails.
5. **Data Quality Assurance:** Attention-check items were embedded to detect inattentive responses; cases failing two or more checks were excluded. Data screening addressed missing values (<5% per scale) via mean imputation.

RESULTS

Descriptive Statistics

- **BLPS Dimensions:** Clarity (M = 3.88, SD = 0.60), Interactivity (M = 3.95, SD = 0.58), Feedback Quality (M = 3.91, SD = 0.62), Flexibility (M = 3.94, SD = 0.59).
- **LAI Subscales:** Goal Setting (M = 3.78, SD = 0.62), Self-Monitoring (M = 3.65, SD = 0.70), Self-Reflection (M = 3.82, SD = 0.58).

Bivariate Correlations

Overall BLPS correlated strongly with LAI total ($r = .58$, $p < .001$). Subscale correlations were:

- BLPS–Goal Setting: $r = .54$, $p < .001$
- BLPS–Self-Monitoring: $r = .49$, $p < .001$
- BLPS–Self-Reflection: $r = .56$, $p < .001$

Regression Analyses

In a hierarchical regression predicting LAI total:

- **Step 1 (Covariates):** Gender ($\beta = .04$, $p = .52$), Age ($\beta = –.03$, $p = .61$), Discipline dummy codes jointly explained 4% variance ($F(3,231) = 3.22$, $p = .024$).
- **Step 2 (BLPS Dimensions):** Adding clarity, interactivity, feedback, and flexibility increased R^2 by .32 ($\Delta F(4,227) = 28.45$, $p < .001$). Significant predictors included:
    - Feedback Quality: $\beta = .28$, $p < .001$
    - Flexibility: $\beta = .24$, $p = .002$
    - Interactivity: $\beta = .19$, $p = .010$
    - Clarity: $\beta = .14$, $p = .040$

For subscale outcomes, feedback quality most strongly predicted goal setting ($\beta = .29$, $p < .001$) and self-reflection ($\beta = .31$, $p < .001$), whereas flexibility was the primary predictor of self-monitoring ($\beta = .27$, $p = .001$).

Discipline Differences

ANOVA tests revealed that engineering students reported lower LAI total scores (M = 3.55, SD = 0.65) compared to humanities (M = 3.92, SD = 0.49), F(4,230) = 2.57, p = .045, suggesting disciplinary culture impacts readiness for autonomous online engagement.

CONCLUSION

This comprehensive survey study affirms that well-designed blended learning environments significantly correlate with enhanced learning autonomy among college students. Crucial design features include high-quality, timely feedback mechanisms and flexible access structures that empower learners to pace their studies. Interactive elements—such as discussion forums, peer review activities, and multimedia modules—further bolster autonomous goal setting and reflective practice, though their efficacy depends on clarity of instructions and embedded metacognitive prompts.

Practical Implications:

- **Faculty Development:** Training should emphasize crafting clear rubrics, incorporating frequent formative assessments, and embedding reflection prompts within course modules.
- **Instructional Design:** Courses should leverage adaptive release features to provide learners with choice, while maintaining structured milestones to guide progress.
- **Analytics Integration:** Learning management systems can surface personalized dashboards, enabling students to visualize performance trends and self-monitor effectively.

Policy Recommendations:

- Institutions should invest in robust LMS platforms that support seamless integration of feedback tools and flexible content delivery.
- Curriculum committees might mandate the inclusion of autonomy-scaffolding elements—such as goal-setting worksheets and reflective journals—in all blended courses.

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