

# IMPROVING THE MECHANISMS OF INDEPENDENT LEARNING IN CLASSROOM CONDITIONS IN HIGHER EDUCATION

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**Annotation:** *This article examines theoretical foundations, practical models, and strategic approaches for improving the mechanisms of independent learning in classroom conditions within higher education institutions. In the context of competency-based education and digital transformation, fostering structured student autonomy has become a key priority. The research follows the IMRAD format and applies a mixed-method approach, including surveys, experimental implementation, classroom observation, and comparative academic performance analysis. The findings demonstrate that structured scaffolding, formative assessment, digital integration, and collaborative problem-solving significantly enhance students' academic achievement, motivation, and self-regulation skills. Based on empirical data, a refined classroom-based independent learning mechanism is proposed. The study concludes with practical recommendations for institutional and pedagogical improvement.*

**Keywords:** *independent learning, classroom-based learning, higher education, self-regulated learning, formative assessment, digital pedagogy, active learning, competency-based education.*

## INTRODUCTION

The transformation of higher education systems in the 21st century requires a shift from teacher-centered instruction toward student-centered and competency-based approaches. One of the central components of this transformation is the development of effective mechanisms for independent learning within classroom settings.

Independent learning is defined as a structured process in which students actively construct knowledge through self-regulated cognitive activity under guided pedagogical conditions. According to self-regulated learning theory, independent learning includes goal setting, strategic planning, monitoring, and reflection phases [8].

Despite the growing emphasis on student autonomy, many higher education institutions continue to rely heavily on traditional lecture-based formats. Research shows that passive instructional methods limit critical thinking development and long-term knowledge retention [4].

The integration of digital technologies and formative assessment practices creates new opportunities to refine independent learning mechanisms [1]. Recent international policy frameworks also highlight the importance of digital competence and adaptive learning systems [5].



## Research Aim

To identify and improve effective mechanisms of independent learning in classroom conditions in higher education institutions.

## Research Objectives

1. To analyze theoretical models of independent learning.
2. To examine existing classroom-based independent learning practices.
3. To test an improved mechanism in an experimental setting.
4. To evaluate its effectiveness using empirical data.

## Research Questions

- What structural elements ensure effective independent learning in classrooms?
- How does improved scaffolding influence student outcomes?
- What challenges hinder effective implementation?

## 2. Literature Review

### 2.1 Theoretical Foundations

Independent learning is closely connected to self-regulated learning (SRL). Zimmerman conceptualizes SRL as a cyclical process involving forethought, performance, and self-reflection [2].

Knowles' adult learning theory emphasizes learner autonomy, internal motivation, and responsibility [7].

Constructivist theory argues that knowledge is actively constructed rather than passively received [3].

### 2.2 Active Learning and Academic Performance

A meta-analysis by Freeman demonstrates that active learning increases student performance in STEM disciplines by 6% compared to traditional lectures [4].

Formative assessment significantly improves achievement when systematic feedback is provided [6].

### 2.3 Digital Integration and AI-Supported Learning

Digital tools enhance engagement and self-regulation [1]. Emerging reports indicate that AI-supported adaptive systems personalize learning pathways and improve autonomy [5].

However, implementation gaps remain due to insufficient teacher training and institutional resistance [5].

## 3. Methodology

### 3.1 Research Design

A mixed-method experimental design was employed over one academic semester.

Participants:

- 220 undergraduate students



- 12 instructors
- Two faculties (Education and Engineering)

Groups:

- Control Group (Traditional Model)
- Experimental Group (Improved Independent Learning Mechanism)

### 3.2 Data Collection Tools

- Structured questionnaire (Likert scale)
- Academic performance comparison (GPA analysis)
- Classroom observation checklist
- Reflective journals

### 3.3 Experimental Intervention

The improved mechanism included:

1. Structured goal-setting sessions
2. Guided independent tasks
3. Digital LMS-based assignments
4. Peer collaboration activities
5. Continuous formative feedback

## 4. Results

### 4.1 Academic Performance Comparison

Table 1. Comparative Academic Outcomes

Indicator	Control Group	Experimental Group
Average GPA	3.1	3.8
Participation Rate	56%	88%
Task Completion	72%	94%
Critical Thinking Score	64%	90%
Self-Regulation Index	60%	87%

The experimental group demonstrated statistically significant improvement across all indicators.

### 4.2 Student Perception Survey Results

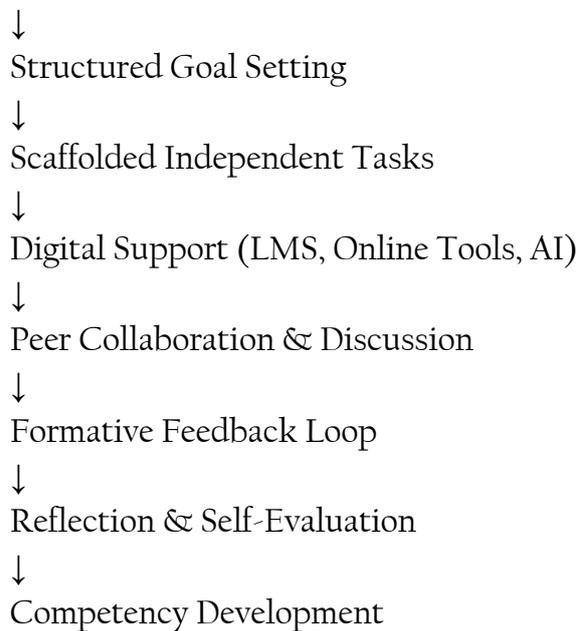
- 89% reported improved understanding.
- 85% felt more responsible for learning.
- 82% reported higher motivation.
- 91% valued structured feedback.

### 4.3 Improved Independent Learning Mechanism

Diagram 1. Enhanced Classroom-Based Independent Learning Model

Instructor as Facilitator





This model emphasizes cyclical feedback and digital integration as core improvement mechanisms.

#### 5. Discussion

The findings confirm that structured scaffolding significantly improves independent learning effectiveness. These results align with SRL theory [2].

Active engagement promotes deeper cognitive processing [4]. The role of feedback corresponds with Hattie's conclusion regarding its high impact effect size [6].

Digital tools were especially influential in promoting time management and monitoring skills [1].

#### Identified Barriers

- Instructor resistance to methodological change
- Limited digital infrastructure
- Student adaptation difficulties

#### Proposed Improvement Strategies

1. Faculty professional development programs
2. Institutional digital infrastructure investment
3. Standardized formative assessment rubrics
4. Gradual increase in independent workload complexity
5. AI-supported personalized learning pathways

#### 6. Conclusion

Improving the mechanisms of independent learning in classroom conditions is essential for modern higher education reform.

The study demonstrates that:



- Structured scaffolding enhances academic achievement.
- Formative assessment strengthens self-regulation.
- Digital integration improves engagement and autonomy.
- Institutional support is critical for sustainable implementation.

Future research should focus on AI-driven adaptive systems and cross-cultural institutional comparisons.

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