The Effectiveness of Flipped Classroom Activities Using Online Media in Enhancing Students' Self-Directed Learning at Chongqing College of International Business and Economics

Huang Zhining [1], Sutthiporn Boonsong[2], Atipong Phetsute[3]*
Education Faculty, Pathumthani University [1, 2, 3]*
Corresponding author's e-mail: atipong.p@ptu.ac.th

Abstract

The objectives of this study were (1) to examine the effectiveness of flipped classroom activities using online media on students' self-directed learning, (2) to compare students' self-directed learning levels before and after the intervention, and (3) to investigate the difference in self-directed learning between an experimental group and a control group. The study employed a quasi-experimental research design with 88 second-year undergraduate students, divided into an experimental group (n=45) and a control group (n=43). The experimental group engaged in pre-class video learning followed by in-class collaborative activities, while the control group received traditional lectures. Research instruments included a self-directed learning questionnaire and an achievement test. Data were analyzed using mean, standard deviation, paired-sample t-tests, and independent-sample t-tests. The findings indicated that students in the experimental group demonstrated significantly higher self-directed learning scores after the intervention ($p < .05$) and outperformed the control group. The study concludes that the flipped classroom model is a potent catalyst for fostering independent learning and student engagement in higher education.

Keywords: Flipped Classroom, Self-Directed Learning, Online Media, Higher Education, Chongqing College

Introduction

Self-directed learning (SDL) is widely recognized as a core competency for lifelong learning and higher education success (Candy, 1991; Garrison, 1997). In digitally mediated environments, SDL becomes particularly crucial as learners must regulate their time, monitor comprehension, and manage cognitive resources independently. The Flipped Classroom (FC) model has been increasingly adopted to foster these competencies by relocating content delivery to pre-class online learning and dedicating in-class time to active engagement (Bergmann & Sams, 2012; Moore & Kearsley, 2012).

Recent empirical studies have demonstrated that flipped learning positively influences self-regulation, self-efficacy, and learning satisfaction (Park et al., 2021; Khodaei et al., 2022; Cheng et al., 2023; Han & Hamzah, 2024). Moreover, technology-enhanced feedback systems and learning analytics dashboards have been shown to strengthen students' self-monitoring behaviors (Chen et al., 2023; Wang et al., 2024). However, limited research has examined SDL development in vocational-oriented Chinese higher education institutions where traditional teacher-centered pedagogy remains prevalent (Zheng et al., 2018).

Furthermore, while previous studies confirm general benefits of flipped learning, fewer investigations provide detailed procedural descriptions of intervention structure, duration, and implementation fidelity in applied university contexts (Ke et al., 2023; Xu et al., 2024). Therefore, a research gap exists in empirically examining how structured flipped classroom activities using online media influence SDL dimensions within Chongqing's applied higher education context.

This study aims to address this gap by systematically implementing and evaluating flipped classroom activities, focusing on measurable SDL components and comparative analysis between experimental and control groups.

Research Methodology

Design: A quasi-experimental pre-test/post-test control group design.

Participants: 88 second-year undergraduate students. The experimental group (45 students) used flipped classroom activities, and the control group (43 students) used traditional methods.

Intervention: The experimental group accessed pre-class videos via online media platforms. In-class sessions focused on group discussions and task-based learning. The control group followed a standard lecture-teacher-led format.

Instruments: A validated self-directed learning questionnaire (covering Learning Responsibility, Time Management, Self-Monitoring, and Motivation) and an English achievement test.

Data Analysis: Descriptive statistics (Mean, S.D.) and inferential statistics (t-test) to compare group differences.

The flipped classroom intervention lasted for eight consecutive weeks (16 instructional hours). Each learning cycle followed a structured three-phase format:

1. Pre-Class Phase (Online Preparation) Students in the experimental group accessed 5–10 minute micro-lecture videos uploaded to the institutional online learning platform. Videos included embedded guiding questions and reflective prompts to encourage metacognitive engagement (Mayer, 2009; Ren, 2024). Students were required to complete short formative quizzes prior to class.

2. In-Class Phase (Collaborative Application) Class time focused on small-group problem-solving tasks, peer explanation, and case-based discussions aligned with Bloom's higher-order cognitive levels (Bloom, 1956). The instructor acted as facilitator rather than lecturer, consistent with constructivist and sociocultural perspectives (Vygotsky, 1978).

3. Post-Class Reflection Phase Students completed brief self-evaluation checklists to monitor their understanding and identify areas requiring review. This reflective component was designed to strengthen self-monitoring and learning responsibility (Garrison, 1997; Chen et al., 2023).

This structured design ensured alignment between SDL theory and instructional practice.

Result

Post-intervention Improvement: The experimental group showed a significant increase in self-directed learning scores compared to their pre-test results.

Between-Group Comparison: Students in the flipped classroom environment achieved significantly higher SDL levels than those in the traditional classroom ($p < .05$).

Dimension Analysis: The most significant improvements were observed in "Learning Responsibility" and "Self-Monitoring," indicating that students became more aware of their own learning progress and goals.

Specifically, the experimental group's mean post-test SDL score increased significantly compared to the pre-test score, with a statistically significant difference at the $p < .05$ level. The independent-sample t-test further confirmed that the experimental group outperformed the control group on overall SDL scores at the conclusion of the intervention, indicating that exposure to flipped classroom activities—rather than maturation or time effects alone—accounted for the observed improvements.

At the dimension level, Learning Responsibility demonstrated the largest mean gain, suggesting that the structured accountability mechanisms embedded in the pre-class

preparation phase—including formative quizzes and guided reflection prompts—effectively heightened students' sense of ownership over their learning. Self-Monitoring also showed marked improvement, which may be attributed to the post-class self-evaluation checklists that prompted students to systematically review their comprehension and identify learning gaps. Gains in Time Management and Motivation, while positive, were comparatively more modest, indicating that these dimensions may require longer intervention periods or additional instructional scaffolding to develop fully.

Classroom observations further corroborated the quantitative findings, revealing that students in the experimental group demonstrated increasingly proactive behaviors over the course of the intervention—including voluntary question-asking, peer explanation, and independent resource-seeking between sessions. These behavioral indicators align with established SDL theory's characterization of self-directed learners as individuals who take initiative, exercise agency in learning decisions, and persist in the face of challenges (Knowles, 1975; Candy, 1991).

Discussion and conclusions

The findings confirm that flipped classroom activities significantly enhance students' self-directed learning compared to traditional instruction. This improvement can be explained through SDL theory, which emphasizes learner autonomy, self-monitoring, and responsibility as core components of independent learning (Candy, 1991; Garrison, 1997).

The pre-class online learning phase required students to manage time and regulate engagement, which likely strengthened learning responsibility—one of the most improved dimensions. This aligns with findings from Khodaei et al. (2022) and Han and Hamzah (2024), who reported that flipped environments promote self-efficacy and readiness for self-directed learning.

The significant gains in self-monitoring may be attributed to the reflective and feedback-driven structure of the intervention. Access to replayable video content and formative quizzes enabled iterative comprehension checks, consistent with learning analytics research demonstrating the importance of feedback loops in enhancing metacognitive awareness (Chen et al., 2023; Wang et al., 2024).

Moreover, dedicating in-class time to collaborative problem-solving aligns with sociocultural theory, which emphasizes knowledge construction through interaction within the Zone of Proximal Development (Vygotsky, 1978). Recent meta-analyses confirm that flipped models are particularly effective when active learning replaces passive lecture time (Park et al., 2021; Ke et al., 2023).

Importantly, the effectiveness observed in this study supports broader evidence that technology integration must be embedded within pedagogically structured frameworks rather than implemented as a purely technological shift (Cheng et al., 2023; Xu et al., 2024).

Despite the positive findings, several limitations must be acknowledged. First, the quasi-experimental design, while including a control group, did not employ random assignment. Therefore, potential selection bias cannot be fully ruled out (Creswell & Creswell, 2018). Although pre-test equivalence was examined, internal validity threats such as maturation or instructor influence may have affected outcomes.

Second, the study was conducted within a single institution in Chongqing, which may limit generalizability to other regional or disciplinary contexts. Cultural learning norms and technological infrastructure differences could influence the effectiveness of flipped models (Ren, 2024; Yu, 2023).

Third, the intervention duration (eight weeks) may not fully capture long-term sustainability of SDL development. Future longitudinal research should examine persistence of SDL behaviors across semesters (Han & Hamzah, 2024).

In conclusion, this study provides compelling evidence that the flipped classroom model, when systematically implemented with structured online media, constitutes an effective pedagogical strategy for developing self-directed learning among undergraduate students in Chinese higher education. The findings demonstrate that students who engaged in flipped classroom activities exhibited significantly higher SDL scores than their counterparts in the traditional classroom, with particularly notable gains in Learning Responsibility and Self-Monitoring—two dimensions that are widely considered foundational to lifelong independent learning.

These outcomes are theoretically consistent with established frameworks in SDL research (Candy, 1991; Garrison, 1997) and with sociocultural perspectives that emphasize the role of scaffolded interaction and metacognitive reflection in promoting learner autonomy (Vygotsky, 1978). The structured three-phase design—pre-class video preparation, in-class collaborative application, and post-class reflective self-evaluation—ensured that each stage of learning meaningfully reinforced students' capacity for independent goal-setting, time management, and self-monitoring.

From a practical standpoint, the study affirms that technology integration must be accompanied by a deliberate pedagogical framework to produce meaningful learning outcomes. Simply providing access to online media is insufficient; the value of the flipped model lies in how it restructures the roles of teacher and learner, repositioning the instructor as a facilitator and empowering students to take ownership of their learning process. These findings carry significant implications for curriculum designers, academic administrators, and instructors in vocational-oriented higher education institutions who seek evidence-based strategies for fostering independent and lifelong learning skills.

While acknowledging the study's limitations—including the single-institution context, the absence of random assignment, and the relatively short intervention period—the results nonetheless contribute meaningfully to the growing body of literature on flipped learning in Chinese higher education. Future research should build upon these findings through longitudinal designs, larger multi-site samples, and qualitative investigations that illuminate students' subjective experiences of transitioning toward self-directed learning. Ultimately, the evidence presented in this study supports the broader adoption of the flipped classroom model as a transformative instructional approach capable of equipping students with the self-regulatory competencies demanded by contemporary knowledge-based societies.

Suggestion

1. Recommendations for Educational Practice:

Gradual Implementation: Instructors should introduce the flipped model gradually. For students accustomed to traditional methods, the sudden shift to total autonomy can be overwhelming. Providing clear checklists for pre-class activities can help bridge the transition.

Quality over Quantity of Media: The online media used for pre-class learning must be concise, engaging, and high-quality. Long, unedited lecture videos may lead to disengagement. It is recommended to use "micro-learning" segments (5-10 minutes) that focus on specific learning objectives.

In-Class Dynamic Shift: To maximize SDL, in-class time must be strictly dedicated to active learning. Teachers should resist the urge to re-lecture the video content and instead focus on facilitating high-level discussions, peer-tutoring, and case studies that require students to apply what they learned online.

Incentivizing Pre-Class Work: Institutions should develop assessment strategies that reward pre-class preparation, such as short online quizzes or "entry tickets" to class, ensuring that all students are ready for the collaborative phase.

2. Recommendations for Future Research:

Long-Term Sustainability: Future research should conduct follow-up studies to determine if the SDL habits developed during a flipped course persist in subsequent semesters when students return to traditional formats.

Technological Barriers: Investigating the "Digital Divide" or the impact of different levels of internet access and technological proficiency on the effectiveness of the FC model would provide more inclusive instructional strategies.

Qualitative Insights: Incorporating student journals or focus group interviews would offer a deeper understanding of the *emotional* experience of moving toward self-direction, including the challenges of motivation and time management from the student's perspective.

Cross-Disciplinary Comparison: Comparing the effectiveness of the flipped classroom in highly technical subjects versus creative or social science subjects could reveal discipline-specific best practices for self-directed learning.

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