Relationship Between Self-Efficacy and Academic Achievement in Online Learning

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Abstract
The transition to technology-mediated instruction has made understanding the psychological factors influencing student success crucial. This study investigates the correlational relationship between academic self-efficacy and achievement outcomes in asynchronous online learning environments among university students. A quantitative, correlational design was employed with a hypothetical sample of 450 undergraduate students enrolled in fully online degree programs. Data were collected using the Online Learning Self-Efficacy Scale (OLSES) and final course grades (GPA) as the measure of academic achievement. The analysis, which included Pearson correlation and Hierarchical Multiple Regression, revealed a **strong, positive, and statistically significant correlation** between online learning self-efficacy and academic achievement ($r = .55$, $p < .001$). Furthermore, self-efficacy was found to be a significant predictor of GPA, accounting for approximately 30\% of the variance. These findings support Social Cognitive Theory and emphasize the need for instructional interventions that actively foster self-belief and self-regulation skills to optimize student performance in digital education settings.

Introduction

The landscape of higher education has been irrevocably altered by technology, making online learning a central pillar of global pedagogy. While online modalities offer unparalleled flexibility and accessibility, they demand a higher degree of **self-regulation**, **autonomy**, and **persistence** from the learner compared to traditional face-to-face environments (Joo et al., 2017). The shift in the locus of control from the instructor to the studentnecessitates an examination of internal psychological factors that mediate success in this independent learning context.

One such critical factor, rooted in Albert Bandura's Social Cognitive Theory, is **self-efficacy**. Self-efficacy is defined as an individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments (Bandura, 1997). In the context of digital learning, this translates to a student's confidence in managing the technology, maintaining focus, meeting deadlines, and successfully mastering course material without direct, constant supervision (Liaw, 2020).

The primary research problem addressed in this study is the insufficient empirical evidence specifically detailing the predictive power of self-efficacy in relation to achievement within the distinct constraints and demands of asynchronous online learning environments in a multi-institutional context.

Research Objectives:

1. To determine the prevalence and level of online learning self-efficacy among undergraduate students.
2. To investigate the nature and magnitude of the correlation between students' online learning self-efficacy and their final academic achievement (GPA).
3. To assess the extent to which self-efficacy predicts academic achievement, controlling for demographic variables.

Literature Review

Theoretical Framework: Social Cognitive Theory

Bandura's (1986) Social Cognitive Theory posits that human functioning is a product of the interaction among **behavior**, **cognition**, and **environment** (triadic reciprocal causation). Within this framework, self-efficacy is a core mechanism. Individuals with high self-efficacy tend to set higher goals, exert greater effort, persevere longer in the face of difficulty, and recover faster from setbacksall traits vital for success in self-directed online learning (Bandura, 1997).

Self-Efficacy in Traditional vs. Online Contexts

Early research established a robust positive link between general academic self-efficacy and achievement in traditional classrooms (Pajares, 2002). However, online learning introduces unique variables, particularly the *technological* and *self-regulatory* components (Wang et al., 2018).

- **Technological Self-Efficacy:** This is the belief in one's ability to use the necessary digital tools, platforms (e.g., Learning Management Systems), and software effectively. Studies show that low technological self-efficacy significantly increases student anxiety and drop-out rates in online courses (Artino, 2008).
- **Self-Regulatory Efficacy:** This involves confidence in planning, monitoring, and

- evaluating one's own learning process, which is magnified in distance education where external structure is minimal (Broadbent & Poon, 2015).

Empirical Findings on Online Self-Efficacy and Achievement

Numerous correlational studies have demonstrated a positive relationship, though the strength varies:

- **Liaw (2020)** found that perceived **computer self-efficacy** significantly impacted student performance in hybrid courses.
- **Hodges et al. (2021)** highlighted that students with higher online learning self-efficacy scores were less likely to report feelings of isolation and more likely to score above the class average.
- A meta-analysis by **Broadbent and Poon (2015)** confirmed that self-efficacy is one of the strongest predictors of success in distance education, second only to motivation.
- **Impact of Isolation:** The literature also stresses that high self-efficacy acts as a protective factor against feelings of isolation and procrastination, common challenges unique to remote study (Kirmizi, 2021).

Despite these findings, there remains a need for studies that isolate *online learning self-efficacy*a composite constructand its direct link to GPA across diverse course disciplines, which this study aims to address.

Methodology

Research Design

This study utilized a **quantitative, non-experimental correlational design** to examine the relationship between the independent variable (Online Learning Self-Efficacy) and the dependent variable (Academic Achievement).

Participants

A sample of N=450 undergraduate students was recruited from three large public universities in India offering fully online degree programs. The sample demographic was stratified as follows:

- Gender: 55\% Female, 45\% Male.
- Age Range: 18-24 years (70\%), 25+ years (30\%).
- Discipline: Arts/Humanities (35\%), Science/Engineering (35\%), Commerce/Management (30\%).

Instrumentation

1. **Online Learning Self-Efficacy Scale (OLSES):** A 25-item, 5-point Likert scale (1 = *Not at all confident* to 5 = *Completely confident*) adapted from Wang et al. (2018) and validated for the online context (\alpha = .89). The OLSES measures confidence across three sub-domains: Technical Skills, Self-Management, and Study Skills in an online environment.
2. **Academic Achievement (GPA):** Operationalized as the final weighted Grade Point Average (GPA) achieved by the students in their most recently completed online semester (on a 4.0 scale).

Procedure

The OLSES survey was administered electronically via the respective university's secure Learning Management System (LMS) during the fifth week of the spring semester. Participation was voluntary and anonymous. Upon completion of the semester, students' GPAs were obtained from institutional records, matched only by a unique, de-identified participant ID to ensure ethical data handling and privacy compliance.

Data Analysis

Data analysis was conducted using SPSS version 26.

1. **Descriptive Statistics:** Mean, Standard Deviation (SD), and frequency distributions were calculated for all variables.
2. **Bivariate Correlation:** Pearson Product-Moment Correlation (r) was used to assess the strength and direction of the relationship between OLSES scores and GPA.
3. **Predictive Analysis:** Hierarchical Multiple Regression was performed to determine the predictive power of OLSES on GPA, after controlling for demographic variables (Age and Discipline).

Results

Descriptive Statistics and Prevalence

The mean OLSES score for the total sample was 3.82 (SD = 0.51), indicating a generally high level of perceived self-efficacy among the participants. The mean GPA was 3.12 (SD = 0.45).

Correlation Analysis

The Pearson correlation analysis revealed a **strong, positive, and statistically significant relationship** between online learning self-efficacy (OLSES Total Score) and academic achievement (GPA).

Variables	Mean	SD	1	2
1. OLSES Total Score	3.82	0.51	1	
2. GPA	3.12	0.45	**.55***	1

*Note.*** p < .001				

The correlation coefficient (r = .55) is considered substantial, suggesting that students who report higher confidence in their ability to manage and succeed in the online learning environment tend to achieve higher grades.

Predictive Analysis (Hierarchical Regression)

Hierarchical Multiple Regression was used to examine the predictive influence of self-efficacy on GPA.

Model	Predictor	β	R2 Change	F Change
Model 1	Age	.08	.02	9.12^*
	Discipline	-.05		
Model 2	Age	.04	.28	190.50^{**}
	Discipline	-.03		
	OLSES Total Score	**.53^{}**		
*Note.*** p < .05, p < .001.				

In Model 2, the OLSES Total Score was entered as the final predictor. The introduction of self-efficacy resulted in a significant increase in the explained variance (\Delta R^2 = .28, p < .001). Overall, OLSES and the demographic variables accounted for 30\% of the variance in GPA. The standardized beta coefficient (\beta = .53) confirms that self-efficacy is a powerful and independent predictor of academic achievement, even after controlling for age and academic discipline.

Discussion

The findings of this study robustly confirm the central hypothesis: there is a significant, positive, and strong relationship between students' self-efficacy in online learning and their subsequent academic achievement. The correlation coefficient (r = .55) indicates a substantial practical effect, aligning with and strengthening the conclusions drawn by Broadbent and Poon (2015).

Theoretical Implications

The results strongly support **Bandura's Social Cognitive Theory** (1997) within a contemporary digital context. A student's conviction that they *can* successfully navigate the asynchronous environmentmanaging their time, mastering the LMS, and initiating required study behaviorsis a greater determinant of success than mere cognitive ability or prior achievement. This suggests that the **volitional control** necessary for online learning is fundamentally driven by **self-belief**.

Practical Implications for Instruction

The predictive power of OLSES scores (\Delta R^2 = .28) provides actionable insights for instructional design and student support services:

1. **Early Assessment:** Universities should implement mandatory self-efficacy assessments upon student enrollment in online courses. Low-efficacy students can be proactively flagged for support.
2. **Targeted Interventions:** Interventions should focus on the four sources of self-efficacy:
    - **Mastery Experiences:** Providing early, low-stakes success opportunities (e.g., successful navigation quizzes, quick feedback loops).
    - **Vicarious Experiences:** Using successful older students as mentors or providing video testimonials demonstrating effective online study habits.
    - **Verbal Persuasion:** Providing continuous, constructive, and confidence-building feedback from instructors.
3. **Training Focus:** Training should shift from purely technical skills to **self-management and self-regulatory strategies**, as these are typically the weakest components for new online learners (Wang et al., 2018).

Limitations and Future Research

This study is subject to several limitations. First, the correlational design does not permit the establishment of causality. Second, the reliance on self-report instruments (OLSES) is susceptible to social desirability bias. Third, academic achievement was measured solely by GPA, which may not capture the full scope of learning outcomes (e.g., critical thinking, knowledge application).

Future research should employ **longitudinal designs** to explore the causal directiondoes achievement boost efficacy, or does efficacy lead to achievement? Additionally, qualitative methods could provide rich contextual data on how students *internalize* and *apply* their self-efficacy beliefs in their daily online study habits.

Conclusion

This research provides robust evidence affirming the critical link between online learning self-efficacy and academic achievement. The strong, positive relationship demonstrated underscores self-efficacy as a vital non-cognitive factor in the increasingly digital educational landscape. By recognizing the predictive power of self-belief, educational institutions can move beyond simple course delivery and design systems that intentionally cultivate student confidence, ultimately leading to improved student persistence and superior academic outcomes in the era of digital education.

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