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The Impact of Self-Efficacy on Motivation and Learning Engagement in Online Courses

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Abstract

With the rapid expansion of online learning, understanding the psychological factors that influence learners' success has become increasingly important. This study investigates the impact of self-efficacy on motivation and learning engagement in online courses, aiming to clarify the mechanisms through which learners' beliefs about their capabilities affect their academic behaviors. A sample of 356 undergraduate and graduate students enrolled in fully online courses participated in the study. Data were collected through validated self-report scales measuring online learning self-efficacy, motivation, and learning engagement, and analyzed using descriptive statistics, correlation analysis, multiple regression, and structural equation modeling (SEM).

Results indicate that self-efficacy is a significant predictor of both intrinsic and extrinsic motivation, as well as behavioral, cognitive, and emotional engagement in online learning. Moreover, motivation partially mediates the relationship between self-efficacy and learning engagement, suggesting that learners' confidence enhances engagement both directly and indirectly through increased motivation. The findings provide empirical support for the theoretical framework linking self-efficacy, motivation, and engagement, highlighting the critical role of psychological factors in digital education.

These results have important implications for online course design and instructional strategies. Enhancing learners' self-efficacy through mastery experiences, scaffolding, timely feedback, and motivational interventions can foster sustained engagement, improve learning outcomes, and promote the development of lifelong learning skills. The study also identifies avenues for future research, including longitudinal and experimental investigations of self-efficacy interventions and the exploration of contextual and cultural factors affecting online learning engagement.

Keywords

Self-Efficacy, Motivation, Learning Engagement, Online Courses, Online Learning

1. Introduction

The global expansion of online learning has transformed educational systems and reshaped expectations for how students access, interact with, and engage in academic content. Initially adopted as a flexible alternative for nontraditional learners, online courses have become a mainstream mode of instruction across universities worldwide, accelerated significantly by technological advancements and the widespread adoption of digital platforms. However, the growth of online education has also brought renewed attention to the psychological and behavioral factors that influence students' academic persistence, performance, and engagement. Among these factors, self-efficacy plays a central role in determining how learners navigate digital environments that require autonomy, self-discipline, and sustained motivation. Self-efficacy, conceptualized as an individual's belief in their capability to perform the actions necessary to achieve specific outcomes, has long been recognized as a foundational determinant of academic achievement [1]. Within online learning environments, where traditional structures of support are often reduced or replaced by asynchronous communication, the influence of self-efficacy becomes even more pronounced.

Online courses differ significantly from face-to-face learning in their reliance on self-regulated learning strategies, including time management, goal setting, independent problem-solving, and metacognitive monitoring. Unlike traditional classrooms where instructors provide immediate clarification, peers offer continuous interaction, and learning routines are reinforced through in-person attendance, online learners must proactively manage their own learning behaviors. This shift places considerable cognitive and emotional demands on students. Research consistently demonstrates that learners with high academic self-efficacy are more likely to initiate challenging tasks, persist in the face of difficulties, and adapt more effectively to the demands of self-directed learning [2]. In contrast, students with low self-efficacy often experience heightened anxiety, procrastination, and avoidance behaviors, which undermine their motivation and reduce their engagement with online content. As online learning environments become increasingly

common, understanding the role of self-efficacy in shaping motivation and engagement is essential for improving student success and designing effective instructional strategies.

Motivation is a critical predictor of academic outcomes in any learning environment, but its importance is amplified in online learning due to the absence of immediate external reinforcement. Motivation in online contexts has been found to depend strongly on internal factors such as perceived competence, interest, and self-regulation. Students who believe they can successfully master course material are more likely to experience intrinsic motivation, which leads to deeper engagement with learning activities and a stronger commitment to course completion [3]. Conversely, learners who doubt their capabilities may disengage early, skip course activities, or participate superficially. A growing body of research highlights the strong, positive association between self-efficacy and multiple dimensions of motivation-including intrinsic motivation, task value, and future-oriented aspirations [4]. These relationships suggest that fostering self-efficacy may be one of the most effective ways to strengthen student motivation in online environments.

Learning engagement represents another central theme in online education research. Engagement is a multidimensional construct encompassing behavioral participation, emotional involvement, and cognitive investment in learning activities. Behavioral engagement involves attending classes, completing assignments, and participating in discussions; emotional engagement involves interest, enthusiasm, and a sense of belonging; and cognitive engagement involves the use of deep learning strategies, such as critical thinking and reflection. Empirical studies have consistently shown that higher levels of self-efficacy are associated with increased behavioral effort, sustained emotional interest, and more sophisticated cognitive strategies [5]. Online learners with strong self-efficacy beliefs are more likely to explore supplementary resources, interact with peers in virtual discussions, and persist during technical or academic challenges. In contrast, low self-efficacy is associated with withdrawal, reduced participation, and superficial processing of course content.

The unique characteristics of online learning environments create both opportunities and barriers to student engagement. On the one hand, online courses offer flexibility, autonomy, and the ability to personalize learning pathways, which may enhance motivation for self-directed learners. On the other hand, online environments often lack immediate instructor support, present increased opportunities for distraction, and demand high levels of digital literacy. Students who enter online courses with low efficacy regarding technology use or online communication may develop negative attitudes toward online learning, further diminishing their engagement [6]. As a result, online learning environments can inadvertently magnify existing differences in students' learning beliefs and self-regulatory competencies. Learners who feel confident may thrive, while those who lack confidence may struggle disproportionately.

A substantial body of research demonstrates that self-efficacy is influenced by four major sources: mastery experiences, vicarious experiences, verbal persuasion, and physiological and emotional states [1]. Each of these sources takes on distinct forms in online learning environments. Mastery experiences, for example, depend heavily on students' ability to manage digital tools and interpret asynchronous feedback. Vicarious experiences-traditionally shaped by observing peers-may be diminished in online settings where peer behavior is less observable. Verbal persuasion through instructor feedback may be delayed or perceived as less personal. Emotional states, such as anxiety triggered by unfamiliar technologies, may hinder learners' belief in their ability to succeed. These dynamics suggest that self-efficacy development may be more challenging in online environments and requires deliberate instructional design strategies.

Despite the extensive literature on self-efficacy and academic performance, several gaps remain in understanding its role specifically within online learning. First, many studies focus on traditional classroom contexts, leaving questions about how self-efficacy functions under digital learning conditions. Second, existing online learning research often measures overall satisfaction or completion rates without examining the psychological mechanisms that drive these outcomes. Third, relatively few studies have examined motivation and engagement together as integrated components influenced by self-efficacy, even though theoretical models suggest a strong interconnection among these variables [7]. Finally, technological changes and the rise of new learning platforms create evolving challenges for learners, necessitating updated research on how self-efficacy shapes participation in increasingly complex digital environments.

Given these gaps, this study investigates the influence of self-efficacy on motivation and learning engagement within online courses. It seeks to understand how students' beliefs about their abilities affect their persistence, emotional involvement, cognitive strategies, and overall satisfaction with online learning experiences. By focusing on university students, who represent one of the largest and most diverse populations of online learners, the study aims to capture the complexity of digital learning behaviors and identify factors that contribute to successful engagement. Through examining the interrelationships among self-efficacy, motivation, and engagement, the research contributes to a more comprehensive understanding of how online learning environments can be designed to support diverse learners and promote long-term academic development.

Ultimately, understanding the role of self-efficacy in online learning is critical for improving both instructional design and student outcomes. As online courses continue to expand globally, educators and institutions must develop strategies to strengthen students' confidence, enhance self-regulation, and create supportive environments that reduce learning barriers. This study therefore serves not only to advance theoretical knowledge but also to inform practical interventions that promote effective, equitable, and engaging online learning experiences.

2. Literature Review

Research on online learning has grown rapidly over the past two decades, reflecting the increasing prevalence of digital education platforms and the need to understand the factors that influence learner success in virtual environments. A substantial body of literature emphasizes the psychological determinants of effective learning, among which self-efficacy has been highlighted as a critical predictor of both motivation and engagement. Bandura's (1997) self-efficacy theory posits that individuals' beliefs about their capabilities influence their choice of activities, effort investment, persistence in the face of challenges, and resilience to setbacks. In online learning contexts, where learners often navigate tasks independently and rely heavily on digital tools, self-efficacy is particularly salient. Learners with high self-efficacy are more likely to engage proactively with course materials, utilize cognitive strategies effectively, and persist in completing assignments despite obstacles, whereas learners with low self-efficacy are prone to avoidance, procrastination, and disengagement.

Empirical studies consistently support the importance of self-efficacy in online education. For instance, Artino (2008) found that students with higher self-efficacy demonstrated greater participation in asynchronous discussion forums and were more likely to complete online assignments on time. Similarly, Zimmerman (2000) emphasized that self-efficacy is not only a predictor of academic performance but also a mediator that influences motivation and the use of self-regulated learning strategies. In the context of online courses, learners' confidence in their ability to manage time, navigate platforms, and comprehend content directly affects the intensity and persistence of their engagement. Research also indicates that self-efficacy interacts with other psychological constructs such as goal orientation, intrinsic motivation, and perceived task value, forming a complex network that shapes learning behaviors. Tsai et al. (2021) demonstrated that online learners with higher self-efficacy exhibited stronger intrinsic motivation and more active engagement, suggesting that confidence in one's abilities enhances both the desire to learn and the actual investment of effort in learning activities.

In addition to its direct influence on learners' motivation and engagement, self-efficacy plays a central role in shaping how students regulate their learning behaviors in online environments. Because online courses rely heavily on autonomous study, students must construct their own learning schedules, maintain self-discipline, and manage potential distractions that arise from technology use. Research has shown that learners with higher self-efficacy demonstrate stronger self-regulation skills, including better goal setting, higher persistence, and more consistent use of learning strategies designed to deepen comprehension [8]. These students also tend to exhibit greater resilience when encountering technical difficulties or ambiguous task instructions, interpreting challenges as opportunities for growth rather than threats to their performance. Conversely, low self-efficacy can result in disengagement, increased dependence on superficial learning strategies, and avoidance of participation in online discussions or collaborative tasks [9]. Online environments exacerbate these differences because they lack the face-to-face accountability cues that traditional classrooms provide. Students who doubt their abilities may become overwhelmed by the perceived complexity of digital tools or by the reduced immediacy of instructor support. Recent studies indicate that self-efficacy not only predicts higher course completion rates but also mediates the relationship between instructional design quality and students' emotional engagement [10]. Furthermore, learners with strong technological self-efficacy-confidence in their ability to use digital tools-are more likely to adapt successfully to online platforms and perceive the learning environment as supportive rather than isolating [11]. These findings underscore that self-efficacy is multifaceted and that both academic and technological confidence contribute substantially to successful online learning.

Motivation, closely intertwined with self-efficacy, is a key determinant of learning outcomes in online environments. The distinction between intrinsic and extrinsic motivation provides a useful framework for understanding learners' behavior. Intrinsically motivated learners engage in tasks for personal satisfaction, curiosity, or interest in the subject matter, whereas extrinsically motivated learners are driven by external rewards or recognition, such as grades or certificates. Research shows that self-efficacy positively influences both forms of motivation. Schunk and DiBenedetto (2020) found that learners who believed in their capability to succeed were more likely to set challenging goals and persist in achieving them, thereby sustaining both intrinsic and extrinsic motivation. In online learning, where immediate feedback and social cues are often limited, learners' self-efficacy serves as a critical internal source of motivation, enabling them to maintain effort and attention over extended periods.

Learning engagement, encompassing behavioral, cognitive, and emotional dimensions, represents the manifestation of motivation in observable learning behaviors. Behavioral engagement includes participation in discussions, completion of tasks, and adherence to deadlines; cognitive engagement refers to the investment in understanding, analyzing, and applying knowledge; and emotional engagement reflects learners' affective responses, including interest, enjoyment, and a sense of belonging (Fredricks, Blumenfeld, & Paris, 2004). Numerous studies have documented the positive relationship between self-efficacy and engagement in online courses. Broadbent and Poon (2015) reported that students with higher self-efficacy spent more time on learning activities, participated more actively in forums, and exhibited greater persistence when faced with challenging tasks. Similarly, Kahu (2013) emphasized that engagement mediates the effect of self-efficacy on learning outcomes, suggesting that confident learners translate their beliefs into sustained, meaningful interaction with course content.

In addition to the direct effects of self-efficacy on motivation and engagement, the literature highlights its role as a mediator and moderator in online learning contexts. For example, learners' prior experience with technology can

moderate the impact of self-efficacy on engagement, with more experienced learners leveraging their confidence to adopt advanced learning strategies, while less experienced learners may struggle despite moderate self-efficacy. Likewise, social presence and instructor support can enhance or attenuate the influence of self-efficacy on motivation. Studies by Richardson, Maeda, and Swan (2017) indicate that online learners with high self-efficacy are more likely to benefit from collaborative and interactive course designs, whereas learners with low self-efficacy require additional scaffolding and feedback to achieve similar levels of engagement. These findings underscore the importance of considering contextual and instructional factors when examining the role of self-efficacy in online education.

Recent research also explores the dynamic interplay between self-efficacy, motivation, and engagement using longitudinal and experimental designs. For instance, Li and colleagues (2020) conducted a study on undergraduate students in fully online courses and found that self-efficacy measured at the beginning of the semester predicted not only immediate engagement but also sustained motivation throughout the course. Moreover, interventions aimed at enhancing self-efficacy-such as goal-setting exercises, progress tracking, and mastery experiences-have been shown to improve both engagement and academic performance, providing practical implications for course design. Such studies highlight that self-efficacy is not a fixed trait but a malleable psychological resource that can be cultivated to support learning success.

Despite these advances, several gaps remain in the literature. First, much of the research focuses on single-course or short-term contexts, limiting the understanding of how self-efficacy influences engagement across diverse online learning environments. Second, while the relationship between self-efficacy and academic performance is well-established, fewer studies systematically examine the mechanisms through which self-efficacy affects the multidimensional aspects of motivation and engagement. Finally, there is a need for integrative frameworks that consider the interaction of learner characteristics, course design features, and psychological processes, providing a comprehensive understanding of learner behavior in online settings. Addressing these gaps is essential for designing interventions and learning environments that enhance learner confidence, sustain motivation, and promote active engagement.

In summary, the literature indicates that self-efficacy plays a central role in shaping learners' motivation and engagement in online courses. High self-efficacy is associated with increased intrinsic and extrinsic motivation, greater behavioral and cognitive engagement, and more positive emotional responses to learning. These relationships are influenced by individual, contextual, and instructional factors, highlighting the need for a holistic approach in research and practice. By examining the interconnections among self-efficacy, motivation, and engagement, scholars and educators can better understand the psychological processes underlying successful online learning and develop strategies to support diverse learners in achieving their educational goals. This study builds on existing theory and empirical evidence to provide an integrative analysis of how self-efficacy impacts motivation and learning engagement in digital learning environments, addressing gaps in the literature and offering practical implications for online education design and implementation.

3. Research Methodology

This study employs a quantitative research design to examine the impact of self-efficacy on motivation and learning engagement in online courses. Quantitative methods are appropriate for this investigation because they allow for the systematic measurement of psychological constructs and the assessment of relationships among variables across a sample of learners. By collecting structured data through validated instruments and employing statistical analyses, this study aims to establish the strength and nature of the associations among self-efficacy, motivation, and learning engagement, providing empirical evidence to support theoretical propositions.

The participants in this study consist of undergraduate and graduate students enrolled in fully online courses at multiple universities. These students were selected because they represent a population for whom online learning is a primary mode of instruction, and thus, their experiences provide meaningful insights into the role of self-efficacy in digital learning contexts. A total of 400 students were invited to participate, and 356 completed valid responses, yielding an effective response rate of approximately 89 percent. Participants vary in terms of age, gender, academic discipline, and prior experience with online learning, allowing for examination of potential differences across demographic and experiential factors. Ethical considerations were addressed by obtaining informed consent from all participants, ensuring voluntary participation, and maintaining the anonymity and confidentiality of the collected data.

Data were collected through an online survey comprising standardized scales for self-efficacy, motivation, and learning engagement. Self-efficacy was measured using the Online Learning Self-Efficacy Scale, adapted from Zimmerman and Kulikowich (2016), which assesses learners' confidence in their ability to complete course tasks, manage time effectively, and use online learning technologies. Motivation was measured through the Online Learning Motivation Scale, which evaluates both intrinsic and extrinsic motivational orientations, capturing learners' internal interest and external incentive structures. Learning engagement was assessed using a multidimensional scale encompassing behavioral, cognitive, and emotional engagement, following the framework proposed by Fredricks, Blumenfeld, and Paris (2004). Each item was rated on a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"), with higher scores indicating greater levels of the respective construct. The reliability and validity of these instruments have been established in prior research, and preliminary analyses of the current data indicate satisfactory

internal consistency, with Cronbach's alpha coefficients exceeding 0.80 for all scales.

The survey also included demographic questions and items regarding participants' prior online learning experience to control for potential confounding factors. Data were screened for missing values, outliers, and normality assumptions prior to analysis. Descriptive statistics were computed to summarize participants' demographic characteristics and the central tendencies of key variables. Correlation analyses were conducted to examine preliminary relationships among self-efficacy, motivation, and engagement, providing initial insights into the expected patterns of association.

To test the hypotheses regarding the impact of self-efficacy on motivation and learning engagement, multiple regression analyses were employed. Self-efficacy was treated as the independent variable, while motivation and engagement served as dependent variables in separate regression models. In addition, hierarchical regression was conducted to explore the potential mediating role of motivation in the relationship between self-efficacy and engagement. This approach allows for examination of both direct and indirect effects, providing a comprehensive understanding of the mechanisms through which self-efficacy influences learning outcomes. Control variables, including age, gender, academic level, and prior online learning experience, were included in the models to account for potential confounding influences.

Structural equation modeling (SEM) was also applied to assess the overall fit of the hypothesized model linking self-efficacy, motivation, and learning engagement. SEM offers advantages in testing complex relationships among latent constructs, allowing simultaneous estimation of multiple pathways and the assessment of indirect effects. Model fit was evaluated using commonly accepted indices, including the chi-square statistic, comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA). Bootstrapping procedures were employed to examine the significance of indirect effects, providing robust estimates of mediation effects.

The methodological approach adopted in this study ensures the rigor and validity of the findings. By combining multiple analytical techniques, including descriptive statistics, correlation analysis, regression, and SEM, the study provides both detailed and integrative insights into the interplay between self-efficacy, motivation, and learning engagement. This comprehensive approach allows for identification of key predictors, exploration of mediating mechanisms, and assessment of the overall structural relationships among variables in online learning contexts.

In addition to statistical rigor, methodological considerations were taken to enhance the generalizability of the findings. The sample was drawn from multiple universities and included students from diverse academic disciplines, ensuring that results are not limited to a single institutional context. Measures with established reliability and validity were employed, and rigorous data screening procedures were applied to maintain data quality. Furthermore, ethical standards were strictly adhered to, ensuring that participants' rights and well-being were protected throughout the research process.

In conclusion, the methodology of this study provides a robust framework for investigating the impact of self-efficacy on motivation and learning engagement in online courses. Through careful selection of participants, validated measurement instruments, and rigorous statistical analyses, the study is designed to yield reliable and generalizable findings. The combination of regression analysis and structural equation modeling enables a nuanced understanding of both direct and indirect effects, offering theoretical and practical insights into the role of self-efficacy in online learning. The results of this methodology are expected to inform course design, instructional strategies, and interventions aimed at enhancing learner confidence, motivation, and engagement in digital educational environments.

4. Data Analysis and Results

This chapter presents the results of the quantitative analyses conducted to examine the impact of self-efficacy on motivation and learning engagement in online courses. The analyses were conducted in several stages, including descriptive statistics, correlation analysis, multiple regression, and structural equation modeling (SEM). These procedures provide a comprehensive understanding of the relationships among the key constructs and test the hypothesized model developed in previous chapters.

Descriptive statistics were first calculated to provide an overview of participants' responses. Table 1 presents the means, standard deviations, and internal consistency coefficients for self-efficacy, motivation, and learning engagement. Participants reported moderately high levels of self-efficacy ($M = 3.85$, $SD = 0.62$), motivation ($M = 3.79$, $SD = 0.58$), and learning engagement ($M = 3.71$, $SD = 0.61$), indicating a generally positive perception of their online learning experiences. Cronbach's alpha values for all scales exceeded 0.80, confirming the reliability of the measurement instruments.

Table 1. Descriptive Statistics and Reliability of Key Variables

Variable	Mean	SD	Cronbach's α
Self-efficacy	3.85	0.62	0.88
Motivation	3.79	0.58	0.85
Learning Engagement	3.71	0.61	0.87

Correlation analysis was conducted to examine the preliminary relationships among the variables. Results indicated significant positive correlations between self-efficacy and motivation ($r = 0.62$, $p < 0.01$), self-efficacy and learning

engagement ($r = 0.57$, $p < 0.01$), and motivation and learning engagement ($r = 0.66$, $p < 0.01$). These findings suggest that learners with higher self-efficacy tend to exhibit greater motivation and engagement in online courses, supporting the theoretical expectation that self-efficacy serves as a foundational psychological factor influencing both motivational and behavioral outcomes.

Multiple regression analyses were performed to assess the predictive effect of self-efficacy on motivation and learning engagement while controlling for demographic variables, including age, gender, academic level, and prior online learning experience. Self-efficacy significantly predicted motivation ($\beta = 0.61$, $p < 0.001$), accounting for approximately 38% of the variance in motivation ($R^2 = 0.38$). Similarly, self-efficacy significantly predicted learning engagement ($\beta = 0.54$, $p < 0.001$), explaining 31% of the variance in engagement ($R^2 = 0.31$). These results confirm that learners' confidence in their ability to perform online learning tasks substantially influences both their motivational levels and active engagement in course activities.

To examine the mediating role of motivation in the relationship between self-efficacy and learning engagement, hierarchical regression and bootstrapping procedures were employed. When motivation was included in the regression model predicting learning engagement, the standardized coefficient of self-efficacy decreased from $\beta = 0.54$ to $\beta = 0.28$, while motivation remained a significant predictor ($\beta = 0.52$, $p < 0.001$). Bootstrapping analysis with 5,000 resamples indicated that the indirect effect of self-efficacy on learning engagement through motivation was significant (95% CI: 0.16–0.34). These findings suggest that motivation partially mediates the relationship between self-efficacy and engagement, indicating that self-efficacy enhances learners' engagement both directly and indirectly by increasing their motivational levels.

Structural equation modeling was further conducted to evaluate the overall fit of the hypothesized model. The SEM results demonstrated good fit indices ($\chi^2/df = 2.45$, CFI = 0.96, TLI = 0.95, RMSEA = 0.058), supporting the proposed relationships among self-efficacy, motivation, and learning engagement. The standardized path coefficients confirmed that self-efficacy positively predicted motivation ($\beta = 0.62$, $p < 0.001$) and engagement ($\beta = 0.27$, $p < 0.01$), while motivation strongly predicted engagement ($\beta = 0.53$, $p < 0.001$). These results are consistent with the regression analyses and provide robust evidence that self-efficacy is a key antecedent of both motivation and engagement in online courses.

Further exploratory analyses were conducted to examine potential differences in the relationships across demographic subgroups. While age and prior online learning experience did not significantly moderate the effects of self-efficacy, gender differences were observed, with female students reporting slightly higher levels of motivation and engagement than male students. However, the overall pattern of relationships among self-efficacy, motivation, and engagement remained consistent across subgroups, indicating the generalizability of the findings.

In conclusion, the data analysis provides strong empirical support for the hypothesized model. Self-efficacy plays a central role in shaping learners' motivation and learning engagement in online courses. Motivation partially mediates the effect of self-efficacy on engagement, suggesting that enhancing learners' confidence not only directly influences engagement behaviors but also strengthens their intrinsic and extrinsic motivation, which in turn promotes greater behavioral, cognitive, and emotional investment in learning. These findings underscore the importance of fostering self-efficacy in online education and provide practical implications for instructional design, including the provision of mastery experiences, timely feedback, and supportive learning environments that reinforce learners' confidence and motivation.

5. Conclusion

This study aimed to examine the impact of self-efficacy on motivation and learning engagement in online courses, addressing a critical gap in the understanding of psychological factors that influence learners' behavior in digital learning environments. The findings from descriptive statistics, correlation analyses, multiple regression, and structural equation modeling consistently demonstrate that self-efficacy is a significant predictor of both motivation and learning engagement. Learners with higher self-efficacy not only report greater confidence in their ability to manage online learning tasks but also exhibit higher intrinsic and extrinsic motivation, as well as stronger behavioral, cognitive, and emotional engagement. These results align with Bandura's (1997) self-efficacy theory, which posits that individuals' beliefs about their capabilities shape their effort, persistence, and resilience in goal-directed activities.

The study further reveals that motivation partially mediates the relationship between self-efficacy and learning engagement. This suggests that while self-efficacy directly influences engagement behaviors, it also operates indirectly by enhancing learners' motivational levels. Learners who believe in their ability to succeed are more likely to set challenging goals, sustain effort in the face of difficulties, and maintain interest and commitment to learning activities. These findings corroborate prior research indicating that self-efficacy and motivation are interdependent constructs that collectively drive learners' engagement and performance in online learning contexts (Schunk & DiBenedetto, 2020; Tsai et al., 2021).

From a theoretical perspective, this study contributes to the literature by extending the application of self-efficacy theory to online education, emphasizing its relevance not only for performance outcomes but also for psychological processes that underpin sustained engagement. The evidence of motivation as a mediating factor provides a more

nuanced understanding of the mechanisms through which self-efficacy influences engagement, offering an integrative framework that links belief systems, affective states, and observable learning behaviors. This integrative perspective is particularly important in online learning environments, where the absence of immediate social cues and instructor supervision necessitates greater self-regulation and internal motivation.

The practical implications of the findings are substantial. Educators and instructional designers can enhance learners' self-efficacy through a variety of strategies, such as providing clear instructions, designing scaffolded learning tasks, offering timely feedback, and facilitating collaborative learning experiences. Mastery experiences, in particular, have been shown to strengthen learners' confidence and resilience, thereby increasing their motivation and active participation in online courses. Furthermore, awareness of the mediating role of motivation suggests that interventions targeting motivational enhancement-such as goal-setting exercises, gamified learning elements, and recognition of achievements-can amplify the positive effects of self-efficacy on engagement. By integrating these strategies, online courses can foster a supportive learning environment that promotes both psychological well-being and academic success.

Despite the contributions of this study, several limitations must be acknowledged. First, the research employed a cross-sectional design, which limits the ability to infer causal relationships among self-efficacy, motivation, and engagement. Although the findings are consistent with theoretical expectations, longitudinal or experimental studies are necessary to establish temporal precedence and causal direction. Second, the sample was drawn from students enrolled in online courses at a limited number of universities, which may affect the generalizability of the results to other populations or educational contexts. Third, the study relied on self-reported measures, which may be subject to social desirability bias or inaccurate self-assessment. Future research could incorporate objective measures of engagement, such as learning analytics, log data, or instructor evaluations, to complement self-report data.

Future research directions can build on the findings of this study in several ways. Longitudinal designs can investigate how self-efficacy, motivation, and engagement evolve over time and how interventions influence these dynamics. Experimental studies could test the effectiveness of specific strategies, such as mastery experiences, peer mentoring, or adaptive learning technologies, in enhancing self-efficacy and engagement. Additionally, future research could explore contextual and cultural factors that moderate the relationships among self-efficacy, motivation, and engagement, such as institutional support, course design features, and learners' prior experiences with digital learning. Comparative studies across disciplines, course levels, or geographic regions may also provide insights into the boundary conditions of the observed relationships.

In conclusion, this study provides robust evidence that self-efficacy is a central determinant of motivation and learning engagement in online courses. Learners who possess greater confidence in their abilities are more motivated and more actively engaged, both directly and indirectly through enhanced motivation. These findings underscore the importance of fostering self-efficacy as a psychological resource in digital education and offer actionable guidance for educators, instructional designers, and policymakers seeking to enhance online learning experiences. By integrating strategies that strengthen learners' confidence and motivation, online courses can support sustained engagement, improved learning outcomes, and the development of lifelong learning skills. Ultimately, this research highlights the critical interplay between psychological constructs and learning behaviors in online education, advancing both theoretical understanding and practical application in the rapidly evolving landscape of digital learning.

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