Article

The Impact of Self-determination Motivation on Academic Achievement in the Context of Knowledge-Oriented Short-Video Learning

Baiyan Du [1,*] and Yuege Lai [1]

[1] College of Teacher Education, Quzhou University, Quzhou, Zhejiang, 324003, China
* Correspondence: Baiyan Du, College of Teacher Education, Quzhou University, Quzhou, Zhejiang, 324003, China

Abstract: In recent years, the ways individuals acquire knowledge and information have evolved significantly, with short video platforms increasingly incorporating educational content and becoming widely used tools for learning. Although prior studies have confirmed the effectiveness of short video–based learning, the role of self-determination motivation in this context remains insufficiently examined compared with traditional online learning environments. Grounded in knowledge-oriented short video learning, this study explores how college students' self-determination motivation influences cognitive academic achievement, focusing on the mediating roles of goal orientation and self-regulated learning strategies. Survey data collected from 505 university students with short video learning experience indicate that self-determination motivation positively predicts goal orientation, self-regulated learning strategies, and cognitive academic achievement, and further enhances cognitive academic achievement through the mediating effects of goal orientation and self-regulated learning strategies. These findings provide theoretical support for improving learning effectiveness in short video learning contexts and offer empirical evidence for the appropriate and optimized use of this instructional approach.

Keywords: Knowledge-based short video learning; self-determination motivation; cognitive academic achievement; goal orientation; self-regulated learning strategies

Published: 14 February 2026

1. Introduction

The advancement of internet technologies has transformed and diversified the channels through which knowledge and information are disseminated. Among these channels, short videos—known for their concise format, rapid delivery, and visually intuitive presentation—have gained widespread popularity among online learners [1]. Since their emergence around 2011, platforms such as TikTok and Bilibili have gradually become prominent in the digital landscape. Over time, these platforms have expanded beyond entertainment functions and increasingly incorporated educational content, thereby providing knowledge-oriented videos that enable learners to access information and broaden their perspectives in everyday contexts [2,3].

Recent industry reports highlight the rapid growth of knowledge-based short video content. A 2022 review indicated that between January and October, news consumption and learning-related content accounted for 30.2% of user demand on short video platforms. During the same period, the number of knowledge-oriented short videos increased by more than 200%, surpassing the 167% growth observed in graphic content. According to the iiMedia Research Report on China's Knowledge Payment Industry (2022–2023), 56.8% of consumers preferred short videos as a learning format, and 75.7% of paying users engaged with knowledge-based short video products. Additionally, survey findings reveal that 61.8% of individuals use short videos during their leisure time

for learning and in-depth knowledge exploration, while 41.6% consider short videos their primary channel for information inquiries [4].

The effectiveness of knowledge-based short video learning on academic outcomes has been validated by various studies. However, some researchers have pointed out potential issues such as fragmented knowledge coherence, weak purposiveness in knowledge acquisition, overreliance on video content, and entertainment-oriented distractions that may dilute learners' attention. Given the limited empirical research in this area, these concerns highlight the need to further analyze short video learning outcomes by drawing on self-determination theory from the online learning field [5].

Motivation is considered the most critical factor in online learning processes [6]. Malinauskas and Pozeriene argued that self-determination motivation is a primary driving force for online learners because the online environment requires learners to autonomously and flexibly tailor learning tasks based on their interests and schedules, continuously revising goals and managing their learning behaviors [7,8]. Moreover, self-determination is frequently referenced in MOOCs, blended virtual classrooms, and mobile applications [9-11].

Research has also highlighted the importance of learner autonomy in short video learning. For instance, it has been suggested that learners should actively guide their engagement with short video content and manage their learning behaviors to enhance outcomes. It has also been noted that students' use of knowledge-based short videos requires self-monitoring and management. Cardamone et al. proposed that short video learners need to selectively focus on content, set feasible learning plans, and concentrate on high-quality videos for specific topics [12]. Ting et al. recommended that learners proactively build knowledge frameworks or mind maps before and after learning sessions, which help in planning and establishing connections between knowledge points to promote deeper learning. These findings align with the emphasis on autonomy in self-determination theory [13].

Beyond its major contribution to addressing issues in online learning and predicting academic success, goal orientation-reflecting learners' objectives in their learning behaviors-is also frequently examined alongside learning outcomes [9]. Positive goal orientation encourages learners to adopt various strategies supporting their learning, improving both experience and achievement [14-16]. Intrinsic motivation and goal orientation are closely related; the pursuit of intrinsic satisfaction can reinforce motivation through goal setting, mediating the relationship between motivation and behavior [17-19]. However, motivation alone is insufficient; self-regulated learning strategies are also necessary [17,20].

Self-regulated learning strategies enhance the efficiency of the learning process by enabling learners to actively monitor and adjust their cognitive and metacognitive activities in pursuit of optimal academic outcomes [21]. Prior research has demonstrated their effectiveness across various educational contexts, including blended learning, fully online environments, higher education, and primary and secondary education settings [22,23]. In addition to directly contributing to academic performance, self-regulated learning strategies may also exert indirect effects on achievement, similar to the mechanism observed in goal orientation research [10,24]. Although empirical studies focusing specifically on short video–based learning are still limited, theoretical and empirical evidence from broader online learning contexts suggests that these strategies are likely to play a facilitative role in short video learning outcomes.

As knowledge-oriented short video communities continue to expand, scholarly inquiry into short video learning remains at a relatively preliminary stage, highlighting the need for further theoretical development. Accordingly, this study investigates the interrelationships among college students' self-determination motivation, goal orientation, self-regulated learning strategies, and cognitive academic achievement within the context of knowledge-based short video learning. It further tests the mediating effects of goal orientation and self-regulated learning strategies in the relationship between self-

determination motivation and cognitive academic achievement. By clarifying these mechanisms, the study aims to propose generalizable approaches for improving learning effectiveness through knowledge-based short videos and to provide a theoretical foundation for future research in digital media–supported education.

2. Literature Review

2.1. Knowledge-Oriented Short Video Learning

Short videos are video clips, ranging from 30 seconds to 10 minutes, that can be shared in real-time on social media platforms via mobile devices [25]. They combine images and sound to intuitively convey knowledge and information [26]. Initially, in 2011, the Viddy application was launched in the United States, allowing users to create 15-second videos and share them on social networks such as Facebook. Subsequently, Instagram also introduced short video sharing features. In 2013, the Chinese market saw the launch of platforms such as TuDou, YouKu, Kwai, and BiliBili, which incorporated short video communities [27]. The debut of TikTok, a short video sharing platform, in 2018 further intensified competition within the short video industry [25,26].

Compared to long videos, short videos have lower production costs, and content creators frequently produce a wide variety of content. Users can access information during their spare time. This feature meets the contemporary demand for fast-paced information consumption, contributing to their widespread popularity [27,28]. In recent years, modes of knowledge transmission have become increasingly diversified, with a growing number of individuals turning to online education rather than relying solely on traditional classrooms and textbooks [29]. The domain of knowledge content in short videos has also experienced significant growth under this trend. Knowledge-based short videos inherit the time and location flexibility of online courses, while also offering concise content with concentrated knowledge points [30].

Therefore, besides enabling learners to autonomously browse and explore learning content quickly on platforms such as BiliBili or TikTok, short videos are widely applied in classroom teaching, self-study support, and other contexts (iiMedia, *China Knowledge Payment Industry Research and Consumer Behavior Analysis Report 2022-2023*). Some researchers have also focused on the effectiveness of this tool. For example, one study found that learners using English knowledge-based short videos improved significantly more in oral accuracy and fluency compared to traditional learners. Another study observed that dance students experienced increased motivation after 24 learning sessions using dance short videos, showing significant improvements in four dimensions: knowledge seeking, material pursuit, personal achievement, and social orientation. A further study conducted a project-based chemistry learning experience through short videos; the results indicated that knowledge-based short videos increased learning interest, helped students develop learning thinking, and improved information processing. These studies collectively demonstrate the effectiveness of short video learning [31].

However, the quality of knowledge-oriented short video content is not always consistent, as information is frequently presented in fragmented forms rather than within a coherent and systematic structure. In certain cases, such videos may even contain inaccurate or misleading information. Prolonged reliance on this format may encourage excessive dependence on video-based materials, reducing opportunities for independent exploration and critical reflection, which may ultimately hinder learning effectiveness and cognitive development. [5]. These issues highlight challenges faced by learners during short video learning.

Thus, while previous research reveals the success of learning outcomes, other studies emphasize the difficulties inherent in the learning process. Reasonable guidance during the learning process is urgently needed. Currently, short video communities focused on knowledge content are still gradually developing, and research on the short video

learning process remains limited. It is necessary to integrate motivation, goals, strategies, and achievement outcomes to provide a universal mechanism for short video learners and propose effective pathways to enhance learning effectiveness.

2.2. Self-Determination Motivation

Motivation is not only a psychological factor that initiates and directs individual behavior but also serves as the driving force for behavioral persistence, functioning as both an energizer and a regulator for individuals. Motivation is commonly categorized into intrinsic and extrinsic forms. Intrinsic motivation originates from an individual's internal drive, typically arising from personal interest or curiosity, and is characterized by feelings of enjoyment and fulfillment experienced during the activity itself. Extrinsic motivation, on the other hand, is induced by environmental factors such as external rewards or pressures that drive behavior to achieve outcomes [32]. As Deci and Ryan pointed out, intrinsic motivation arises from the behavior itself when attempting to complete a task, independent of any goals, achievements, or rewards; it is a form of self-determination motivated by interest and enjoyment. Extrinsic motivation is voluntary behavior executed to obtain external compensation or results [33]. Intrinsic motivation, beyond involving enjoyment, interest, and passion, naturally arises from personal factors such as expectations, needs, and curiosity. Because the activity itself provides inherent satisfaction or compensatory qualities, intrinsic motivation does not rely on external inducements. In contrast, extrinsic motivation depends on environmental factors such as rewards, social pressures, or punishments, with an emphasis on outcomes rather than the process itself.

Early research by Harlow, based on experiments with monkeys solving puzzles for rewards, found a correlation between extrinsic and intrinsic motivation [34]. De Charms emphasized the importance of intrinsic motivation, arguing that if external rewards are provided to trigger intrinsic motivation, the frequency of external rewards increases, the likelihood of triggering intrinsic motivation decreases, rendering external compensation meaningless [35]. Thus, early views on intrinsic and extrinsic motivation were somewhat incompatible. In the 1980s, new perspectives emerged on the relationship between intrinsic and extrinsic motivation. Mogan proposed a complex interaction between the two, distinguishing between controlling and informational aspects of extrinsic motivation [36]. When individuals perceive external control, intrinsic motivation weakens; conversely, when they perceive external informational feedback, intrinsic motivation increases. This means extrinsic motivation does not always conflict with intrinsic motivation; rather, they can complement each other.

Following this trend, Self-Determination Theory (SDT), which centers on individual autonomy and self-concept, began to gain prominence. Ryan and Connell argued that the relationship between extrinsic and intrinsic motivation is not simply oppositional or clearly delineated, but rather they coexist [37]. Even when extrinsic motivation intervenes, individuals can regulate or control their behavior through autonomy or self-determination, with the extent of regulation determining the influence of extrinsic motivation. Deci and Ryan described motivation as a continuum from amotivation (complete lack of autonomy) to extrinsic motivation (partial autonomy) and finally to intrinsic motivation (full autonomy). Extrinsic motivation is further divided into external regulation, introjected regulation, and identified regulation based on different degrees of autonomy [38]. This continuum reflects that as individuals' autonomy increases, extrinsic motivation is internalized and becomes increasingly autonomous, ultimately approaching the high-autonomy state of intrinsic motivation.

When individuals are in an amotivated state, they lack goals and execution power and may experience learned helplessness [38-40]. This occurs due to perceived limitations in self-ability, lack of compensation or rewards, or absence of desired outcomes, leading to diminished importance of behavior and resistance to external influence [39]. According

to SDT, amotivation arises when there is a lack of perceived efficacy or regulatory capacity regarding desired outcomes, and complete inability to regulate one's behavior [38].

External regulation, a low-autonomy form of extrinsic motivation, means behavior is performed according to prompts or emphasized outcomes from authorities such as parents or teachers. Behavior driven by external regulation typically shows low persistence and disappears once compensation is withdrawn [39]. Introjected regulation arises from internally imposed pressure based on self-esteem or avoidance of guilt and shame [41]. Unlike external regulation, introjected regulation is self-imposed but represents only partial internalization of motivation [38]. Behaviors driven by introjected regulation tend to be more persistent than external regulation and have the potential to transform into identified regulation and intrinsic motivation [42]. Identified regulation reflects a deeper level of internalization where individuals value their behavior as important and purposeful, engaging in it to achieve goals rather than for the inherent pleasure of the behavior itself. Therefore, identified regulation is still classified as extrinsic motivation, but it is more closely related to intrinsic motivation [38]. Intrinsic motivation, the prototype of self-determined behavior, is driven by interest in the task itself and represents the highest level of self-determination motivation [37].

With the development of motivation education, positive roles beyond intrinsic motivation have been identified [43]. For example, Yu et al. demonstrated that identified regulation influenced academic performance in online learning environments [44]. Jeon found that both identified regulation and intrinsic motivation enhanced students' creative problem-solving abilities [45]. Vallerand associated strong self-determination with positive psychological functioning, indicating that high self-determination predicts positive outcomes, while low self-determination leads to decreased and negative motivation [46]. Therefore, this study selects intrinsic and regulatory motivations as components of self-determination motivation.

The development of learners' autonomous motivation is closely related to the development of their goal orientation, with both emphasizing focus on the behavioral process rather than merely the outcomes [17,47]. Most empirical research has examined the influence of goal orientation on self-determination motivation; however, studies investigating the reverse-self-determination motivation driving goal orientation-are scarce [48]. Cerasoli and Ford analyzed the causal relationship between self-determination motivation and goal orientation, suggesting that the intrinsic drive to master a task leads individuals to adopt mastery-oriented goals, which further enhance intrinsic motivation and its penetration [17]. Mastery goals provide additional purpose and focus to intrinsic motivation, mediating the relationship between motivation and behavioral outcomes [18,19]. Liu similarly found that higher levels of autonomous motivation correlate with greater proactive engagement in goals. Thus, goal orientation serves as a complementary condition under self-determination [47].

However, motivation by itself does not necessarily guarantee positive outcomes. For instance, a child may enthusiastically engage in repeatedly striking pots and pans to produce sounds and persist for an extended period, yet still demonstrate limited performance [17]. Thus, even when learners possess strong motivation, the effective regulation of learning through appropriate strategies is essential to optimize outcomes [49]. Empirical evidence supports this view. An, Xi, and Yu found that motivation serves as a mediator between technology acceptance and self-regulated learning [50]. Similarly, Teng reported that both motivation and task value significantly predict the use of self-regulated learning strategies in English learning contexts [51]. Longitudinal research further indicates that self-determination motivation remains relatively stable over time and significantly predicts the development of self-regulated learning strategies, with motivation at one stage influencing strategic behavior at later stages.

Within short video learning environments, empirical investigation into the function of self-determination motivation remains limited. Nevertheless, existing studies highlight the importance of learner autonomy in selecting content, managing learning processes,

and applying strategies to cope with challenges in short video contexts [12,13]. Such characteristics align closely with the principles of self-determination theory, suggesting the need for further exploration of the relationships among self-determination motivation, goal orientation, learning strategies, and academic achievement in short video learning settings.

2.3. Goal Orientation

The concept of goal orientation is based on achievement motivation theory [52]. Learners typically engage in learning activities driven by their own learning goals and reflect on their reasons for doing so. During this process, learners' choices of learning strategies, achievement focus, attitudes, and performance vary individually. Goal orientation represents an individual's intention regarding how they approach and participate in learning activities [53]. Various studies have used different terminologies to describe goal orientation. For example, Dweck, Elliot and Dweck classified goal types into learning goals and performance goals [54,55]; Eison, Pollo, and Milton referred to them as learning-oriented and achievement-oriented goals [56]; Ames and Archer distinguished mastery goals and performance goals [57]; Meece, Blumenfeld, and Hoyle categorized goals into task mastery, self or social goals, and task avoidance goals [53]. Although terminology varies, the core research content is largely consistent [58]. Generally, two major categories emerge: individuals with learning goals, learning orientation, or mastery goals value the learning process itself, emphasize effort and its effectiveness; conversely, performance goals, achievement goals, or execution goals are viewed as means to obtain external recognition and avoid negative evaluation. Based on this foundation, this study adopts the classification of mastery goal orientation and performance goal orientation.

Mastery goal orientation embodies the belief that effort leads to competence development and desirable outcomes, functioning as an attributional foundation that sustains achievement-related behavior. It is also closely associated with the effective implementation of self-regulated learning strategies [57,59]. Learners who endorse mastery goals prioritize the learning process, actively apply strategies to enhance their abilities, willingly engage in challenging tasks, and demonstrate genuine interest and positive attitudes toward learning activities [57,60]. In contrast, performance goal orientation centers on external evaluations and social comparison [54], treating learning primarily as a means of attaining normative success [61,62]. Individuals with strong performance goals are more likely to avoid challenging tasks, rely on surface-level or short-term strategies, experience negative emotions when success is uncertain, and feel satisfied mainly when achieving results with minimal effort [53]. Consequently, mastery-oriented learners tend to adopt deeper regulatory strategies and generally show stronger positive associations with academic achievement. Although performance-oriented learners may achieve immediate outcomes by focusing on specific results, their limited emphasis on reflection and strategic adjustment often weakens long-term learning effectiveness, resulting in comparatively lower explanatory power for sustained academic achievement.

Extensive educational research has examined achievement goal theory. Traditional dichotomous models conceptualize mastery and performance goals as opposite ends of a continuum, suggesting that endorsement of one orientation implies lower endorsement of the other [54]. However, emerging evidence challenges this strict opposition, indicating that performance goals do not invariably produce negative consequences and that the simultaneous adoption of mastery and performance goals may yield more adaptive outcomes [63]. In online learning environments—where resources are abundant yet often fragmented—reliance on a single goal orientation may lead to disorientation and reduced performance. The dynamic and flexible nature of digital learning contexts requires learners to continuously adapt their strategies [64]. Accordingly, learners who maintain

multiple goal orientations are more likely to employ diverse self-regulatory strategies, thereby enhancing learning engagement and academic expectations [15,65].

A similar pattern may be observed in short video learning environments. As an accessible digital learning format that delivers concentrated knowledge within brief time spans, short videos attract a large number of learners. Empirical findings suggest that goal orientation positively relates to academic achievement in short video contexts. Nevertheless, the fragmented structure of short video learning may render a single goal orientation insufficient to sustain coherent learning behaviors and long-term motivation, potentially undermining outcomes [5]. Moreover, the specific mechanisms through which goal orientation influences self-regulated learning and academic achievement in short video environments remain underexplored. Drawing on evidence from broader online learning research, it is reasonable to infer that adopting multiple goal orientations may facilitate the use of effective learning strategies and ultimately improve academic performance in short video learning settings [53].

2.4. Self-Regulation in Learning

Since the late 1970s, educational research has increasingly shifted its emphasis from teacher-centered instruction to learners' cognitive development, leading to the emergence of the concept of self-regulated learning (also described as self-controlled or self-directed learning). This competence develops progressively through experience, enabling learners to establish goals, monitor their progress according to their abilities, adjust objectives when necessary, and reduce excessive reliance on social comparison. Although definitions differ across scholars, common elements can be identified. Schunk conceptualizes self-regulated learning as encompassing processes such as focused attention, organization, encoding and retrieval of information, structuring effective learning environments, and mobilizing available resources, emphasizing that these skills do not automatically emerge through maturation or mere environmental exposure [66]. Pintrich and Groot describe it as learners' capacity to acquire, organize, manage, and regulate information in long-term memory for subsequent retrieval and application [67]. Zimmerman, a leading figure in this field, characterizes self-regulated learning as an active and systematic process through which learners monitor and control their cognition and behavior in pursuit of academic goals [68]. Collectively, these perspectives underscore the integration of cognitive and metacognitive processes within self-regulated learning strategies.

Cognitive strategies refer to the methods learners use, based on their experiences, to memorize and understand learning content, typically involving rehearsal, elaboration, and organization [67]. Rehearsal involves repetitive memorization of key information to transfer it into long-term memory but requires further elaboration, meaning adding known information and linking it to new knowledge. Organization entails segmenting information into parts and establishing logical connections. Metacognitive strategies represent higher-order cognitive skills and play a crucial role in self-regulated learning. They primarily consist of planning, monitoring, and regulating activities during learning. Planning involves selecting appropriate cognitive strategies beforehand, outlining content, and posing and analyzing questions. Monitoring refers to assessing one's understanding during learning, such as checking attention focus, evaluating comprehension, and problem-solving speed. Regulation means continuously reviewing the appropriateness of strategies and adjusting their difficulty if issues arise.

A substantial body of research conducted in online learning contexts has consistently demonstrated the positive association between self-regulated learning strategies and academic achievement. For instance, Xu, Duan, Padua, and Li identified self-regulated learning strategies as significant predictors of academic performance during the large-scale transition to online higher education [21]. Xu, Zhao, Zhang, Liew, and Kogut further reported that interventions designed to enhance self-regulated learning strategies effectively improve academic outcomes across primary, secondary, higher, and adult

education in both online and blended formats [22]. In addition, Broadbent found that the use of self-regulated learning strategies is positively related to performance in online and blended environments, with students in fully online settings demonstrating more frequent strategic engagement [23]. A review by Broadbent and Poon synthesizing 12 studies published between 2004 and 2014 also confirmed significant positive relationships between academic performance and strategies such as time management, metacognition, effort regulation, and critical thinking, whereas rehearsal, elaboration, and organizational strategies showed comparatively limited empirical support [69].

Despite these findings, empirical research examining self-regulated learning strategies specifically within knowledge-based short video learning remains limited. Evidence from broader online learning research consistently underscores the crucial role of self-regulated learning strategies in promoting academic success across diverse educational levels and instructional contexts. Accordingly, it is reasonable to anticipate that similar patterns may emerge in knowledge-oriented short video learning environments.

2.5. Self-Perceived Academic Achievement

Academic achievement generally denotes the degree to which educational objectives are accomplished and is widely regarded as an important indicator of learners' cognitive development [70]. Although no single consensus definition exists, academic achievement is typically understood from either a narrow or a broad perspective. In its narrow sense, it refers to observable academic performance, commonly assessed through measurable indicators such as examination scores, grade point averages, and accumulated credits [71]. In contrast, the broader interpretation incorporates multiple dimensions, including the development of personal competencies, psychological and cognitive growth, and both intellectual and non-intellectual outcomes, often evaluated through comprehensive assessments and self-reported measures. When conceptualized in this broader manner, academic achievement is frequently described as perceived academic achievement, emphasizing learners' subjective evaluations and judgments of their academic progress rather than relying exclusively on objective performance metrics [70,72,73].

Initially, Piaget linked learners' cognitive processes with learning outcomes [74]. Subsequent research on perceived academic achievement emphasizes adapting education to learners' needs rather than forcing all students into a uniform learning pace, thereby ensuring a smooth learning process by focusing on cognitive gains [75]. This is especially relevant in self-directed learning contexts where learners engage in diverse subjects and themes, making traditional score-based assessments difficult; perceived academic achievement thus becomes a useful alternative [76]. Moreover, learners' perceived academic achievement generally correlates with actual performance and aligns well with objective results [77-79]. Measurements based on self-report questionnaires, particularly those resembling academic achievement items, exhibit high internal consistency. For adult learners with increasingly diverse educational experiences, perceived academic achievement measures prove even more reliable [78]. Given that this study targets university students, perceived academic achievement is a theoretically and empirically viable metric, providing insights into learners' subjective indicators rather than relying solely on external evaluations [76]. More mature self-assessments correspond to more accurate predictions of actual achievement [80].

The mediating functions of goal orientation and self-regulated learning strategies in promoting academic achievement have been extensively examined in prior research. Evidence suggests that certain personal traits may not directly predict performance but can exert indirect effects through goal-related mechanisms. For example, although grit alone does not significantly influence academic achievement, it can positively affect performance when operating through mastery and approach goal orientations. Cerasoli and Ford further reported that mastery goal orientation mediates the association between

intrinsic motivation and academic achievement [17]. In addition, Barnard, Paton, and Lan identified a regulatory role of self-regulated learning in the relationship between online course interaction and academic outcomes [24]. Similarly, Wei, Saab, and Admiraal, in their analysis of MOOC learning processes, demonstrated that cognitive and metacognitive self-regulated learning strategies significantly mediate the links among motivation, perceived learning support, engagement, and perceived academic achievement [10].

Although the beneficial effects of short video–based learning on academic performance have been supported by empirical findings, research has also highlighted potential challenges in learners' behavioral engagement within such environments [5]. Whether goal orientation and self-regulated learning strategies function as mediating mechanisms influencing academic achievement in short video learning contexts remains insufficiently understood. Therefore, further empirical inquiry is necessary to clarify how these psychological and strategic factors jointly shape learning outcomes in short video–based educational settings.

3. Method

3.1. Research Model and Hypotheses

This research constructs a sequential mediation model to explore the pathways linking self-determination motivation to perceived academic achievement, with goal orientation and self-regulated learning strategies serving as mediating variables. The overall conceptual framework is presented in Figure 1.

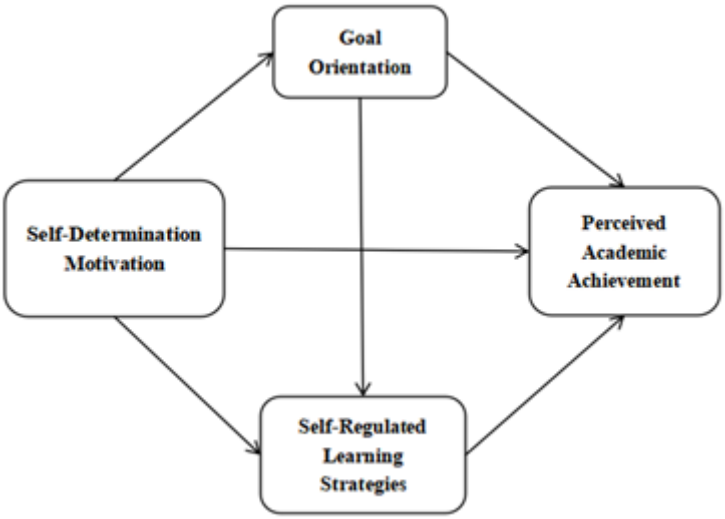

Figure 1. Sequential Mediation Model Linking Self-Determination Motivation to Academic Achievement.

Specifically, self-determination motivation is posited to directly influence goal orientation, self-regulated learning strategies, and perceived academic achievement. Previous research has shown that autonomous forms of motivation significantly shape learners' goal orientations [17,47], promote the adoption of self-regulated learning strategies [51], and positively predict academic outcomes [9].

Moreover, goal orientation is proposed to affect both the deployment of self-regulated learning strategies and perceived academic achievement. Learners who possess well-defined and adaptive goal orientations are more likely to apply effective learning strategies and achieve superior academic performance [15]. In addition, based on the studies by Xu, Duan, Padua, and Li; Xu, Zhao, Zhang, Liew, and Kogut; Broadbent; and

Broadbent and Poon, self-regulated learning strategies are found to influence perceived academic achievement. [21–23,69].

Drawing upon these theoretical perspectives and empirical findings, this study further investigates whether goal orientation and self-regulated learning strategies function as mediating mechanisms in the association between self-determination motivation and perceived academic achievement. Accordingly, the following hypotheses are advanced:

H1: Self-determination motivation positively influences goal orientation.

H2: Self-determination motivation positively influences self-regulated learning strategies.

H3: Self-determination motivation positively influences perceived academic achievement.

H4: Goal orientation positively influences self-regulated learning strategies.

H5: Goal orientation positively influences perceived academic achievement.

H6: Self-regulated learning strategies positively influence perceived academic achievement.

H7: Goal orientation mediates the relationship between self-determination motivation and perceived academic achievement.

H8: Self-regulated learning strategies mediate the relationship between self-determination motivation and perceived academic achievement.

H9: Goal orientation and self-regulated learning strategies jointly form a sequential mediation pathway between self-determination motivation and perceived academic achievement.

3.2. Instruments

The operationalization of self-determination motivation, goal orientation, self-regulated learning strategies, and perceived academic achievement is presented in Table 1. All constructs were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Self-determination motivation was measured using an adapted instrument originally developed by Jeon, comprising 11 items across two dimensions [45]. The identified regulation dimension included six items reflecting engagement and enjoyment in learning activities (e.g., “Learning is an interesting activity,” “When I discover something interesting while learning, I become fully engaged,” and “I feel happy when I master knowledge that I previously did not understand”). The intrinsic motivation dimension consisted of five items emphasizing the perceived importance and future value of learning (e.g., “I study because I believe learning is important,” “I think learning is a way to achieve my dreams,” and “I study for my future”).

Goal orientation was assessed using an adapted version of an established achievement goal orientation scale containing 10 items divided into two subdimensions. Mastery goal orientation (five items) captured learners’ focus on competence development and knowledge acquisition (e.g., “I care about whether I can learn new things,” “I try to learn as much knowledge as possible when studying,” and “My goal is to learn many new learning methods”). Performance goal orientation (five items) reflected concern with social comparison and external evaluation (e.g., “I care about whether others think I am a good student,” “It is important to me that others see me as a capable learner,” and “One of my goals is to show others that learning is easy for me”).

Self-regulated learning strategies were evaluated using an adapted 27-item questionnaire encompassing cognitive and metacognitive strategies. The cognitive strategy dimension (17 items) assessed rehearsal and review behaviors (e.g., “I try to rehearse what I have learned,” “I try to remember as much content as possible,” and “I review what I have learned after studying”). The metacognitive strategy dimension (10 items) examined planning and monitoring processes (e.g., “Before I begin learning, I think

about what I will learn and how I will learn it," "I consider how to study before starting," and "I begin studying after determining the sequence of learning tasks").

Perceived academic achievement was measured using an adapted five-item scale derived from prior research. Representative items included statements such as "I have learned many different things through short-video learning," "Through short-video learning, my understanding of some subjects has become clearer," and "Through short-video learning, my understanding of subjects I am interested in has become deeper."

3.3. Participants and Procedure

The sample comprised university students who had prior experience with short-video learning. The questionnaire clearly specified the target population and was developed based on validated measurement frameworks from previous studies. Content validity was ensured through expert review by scholars in related research areas.

At the pilot stage, three students were invited to complete the preliminary questionnaire. Based on their feedback, ambiguous or potentially confusing items were revised to enhance clarity and response accuracy. The final questionnaire contained two sections. The first section gathered demographic information relevant to short-video learning, including gender and academic year. The second section assessed self-determination motivation, goal orientation, self-regulated learning strategies, and perceived academic achievement. All items were mandatory to ensure complete responses.

Given the advantages of online surveys—such as cost efficiency, absence of geographic constraints, and rapid data collection [81]—the finalized questionnaire was administered online in August 2024 via the Wenjuanxing platform. With assistance from colleagues and acquaintances, eligible students were invited to participate through the designated survey link. To enhance statistical power and improve the robustness of the findings, efforts were made to obtain a sufficiently large sample.

A total of 505 valid questionnaires were retained for analysis. Of the respondents, 281 (55.6%) were female and 224 (44.4%) were male. The distribution by academic year was as follows: 100 first-year students (19.8%), 151 second-year students (29.9%), 130 third-year students (25.7%), and 124 fourth-year students (24.6%).

Data analysis was conducted using SPSS 26.0 and Mplus 8.3. Reliability testing, exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) were performed to evaluate the measurement properties. Given the relatively large number of observed items for the primary constructs, parceling techniques were employed by aggregating subdimensions of self-determination motivation, goal orientation, and self-regulated learning strategies. This approach facilitated model estimation and improved overall model fit. Subsequently, the proposed structural paths and mediation effects among the variables were examined.

4. Results

4.1. Reliability Analysis

To assess the reliability of the four primary constructs, internal consistency analyses were conducted to evaluate the stability and coherence of the measurement scales. Reliability reflects the extent to which a measurement instrument produces consistent results under repeated applications. Common approaches include test–retest reliability, split-half reliability, and internal consistency estimation [82].

Among these techniques, Cronbach's alpha (α) is widely adopted to assess internal consistency in empirical studies [82]. Nunnally suggested that a coefficient of 0.60 or above represents an acceptable threshold for reliability [83].

The results indicate that Cronbach's alpha coefficients for all major constructs exceeded 0.70, demonstrating strong internal consistency. Furthermore, composite reliability (CR) values were greater than 0.80, and average variance extracted (AVE)

values surpassed the recommended cutoff of 0.50. These findings confirm adequate reliability and convergent validity of the measurement instruments. Detailed statistics are reported in Table 1.

Table 1. Reliability and Validity Assessment of Study Constructs.

Construct	Cronbach's α	CR	AVE
Self-determination motivation	0.881	0.773	0.630
Goal Orientation	0.904	0.851	0.740
Self-Regulated Learning Strategies	0.967	0.821	0.696
Cognitive Academic Achievement	0.991	0.991	0.954

4.2. Validity Analysis

Following the reliability evaluation of the four primary constructs, exploratory factor analysis (EFA) was conducted to further examine construct validity. The Kaiser–Meyer–Olkin (KMO) index and Bartlett's test of sphericity were applied to determine whether the data met the requirements for factor analysis. These preliminary diagnostics assess sampling adequacy and the extent to which item correlations justify factor extraction [84]. Reliability coefficients were also calculated for each identified subdimension.

To evaluate the convergent validity of self-determination motivation, all corresponding items were subjected to EFA. As reported in Table 2, the KMO value reached 0.764, exceeding the recommended threshold and confirming sampling adequacy. Bartlett's test of sphericity was statistically significant ($\chi^2 = 4234.20$, df = 55, $p < 0.001$), indicating sufficient correlations among items for factor analysis.

Table 2. Factor Structure and Loadings of Self-Determination Motivation.

Factor		Item	Factor Loadings		Cronbach's α
			1	2	
Self-Determination Motivation	Identified Regulation	D3	.868	.084	0.908
		D4	.806	.055	
		D6	.664	.410	
		D1	.854	.147	
		D5	.853	.073	
		D2	.837	.165	
	Intrinsic motivation	D8	.038	.714	0.887
		D11	.191	.856	
		D10	.165	.823	
		D7	.105	.842	
		D9	.143	.875	
Eigen Value			4.098	3.628	
Explained Variance (%)			37.251	32.981	
Cumulative Variance (%)			37.251	70.232	
KMO=0.764; Bartlett=4234.2; df=55 ; P=0.000					

Two factors were extracted, corresponding to identified regulation and intrinsic motivation. Factor loadings ranged from 0.664 to 0.875, all surpassing the suggested benchmark of 0.60, thereby supporting convergent validity. The internal consistency coefficients were satisfactory, with Cronbach's α values of 0.908 for identified regulation and 0.887 for intrinsic motivation.

For goal orientation, the EFA yielded a KMO value of 0.873, suggesting strong sampling adequacy. Bartlett's test of sphericity was again significant ($p < 0.001$),

confirming the suitability of the data for factor extraction. As displayed in Table 3, two distinct factors emerged—mastery goal orientation and performance goal orientation—with factor loadings ranging from 0.750 to 0.952. The reliability coefficients were 0.953 for mastery goals and 0.948 for performance goals, indicating excellent internal consistency.

Table 3. Exploratory Factor Analysis Results for Goal Orientation.

Factor		Item	Factor Loadings		Cronbach's α
			1	2	
Goal Orientation	Mastery Goal	X3	.945	.133	0.953
		X5	.810	.097	
		X1	.945	.141	
		X4	.916	.140	
		X2	.928	.163	
	Performance Goal	X7	.106	.922	0.948
		X6	.187	.750	
		X9	.103	.927	
		X10	.137	.948	
		X8	.124	.952	
Eigen Value			4.235	4.170	
Explained Variance (%)			42.345	41.699	
Cumulative Variance (%)			42.345	84.044	
KMO=0.873; Bartlett=6171.95; df= 45; P=0.000					

The convergent validity of self-regulated learning strategies is presented in Table 4. After including all items in the EFA, the KMO value was 0.860, and Bartlett's test of sphericity was significant (χ^2 = 19683.51, p < 0.001), indicating that the measurement instrument was appropriate for this study. Two sub-dimensions-cognitive strategies and metacognitive strategies-were identified, with factor loadings ranging from 0.837 to 0.984. The Cronbach's α coefficients were 0.997 for cognitive strategies and 0.985 for metacognitive strategies, indicating excellent reliability.

Table 4. Exploratory Factor Analysis Results for Self-Regulated Learning Strategies.

Factor		Item	Factor Loadings		Cronbach's α
			1	2	
Self-Regulated Learning Strategies	Cognitive Strategies	C6	.983	.049	0.997
		C12	.965	.030	
		C1	.983	.045	
		C11	.965	.030	
		C9	.982	.057	
		C7	.981	.043	
		C2	.984	.056	
		C3	.983	.045	
		C15	.966	.036	
		C13	.965	.030	
		C16	.966	.036	
		C10	.965	.030	
		C17	.966	.036	
		C4	.984	.051	
		C5	.981	.048	
		C14	.966	.036	
		C8	.982	.052	

Metacognitive Strategies	C18	.038	.956	0.985
	C21	.004	.950	
	C19	.035	.958	
	C24	.015	.917	
	C27	.123	.837	
	C26	.041	.947	
	C23	.040	.943	
	C25	.043	.950	
	C20	.032	.958	
	C22	.025	.956	
Eigen Value		16.166	8.827	
Explained Variance (%)		59.874	32.691	
Cumulative Variance (%)		59.874	92.565	
KMO= 0.860; Bartlett=19683.51; df=351; P=0.000				

Cognitive academic achievement consisted of five items. As shown in Table 5, the KMO value was 0.901, and Bartlett's test of sphericity was significant ($\chi^2 = 5672.51$, $p < 0.001$). Factor loadings ranged from 0.980 to 0.988, all exceeding 0.60. The Cronbach's α coefficient was 0.991, supporting its suitability as a single-factor construct.

Table 5. Factor Structure and Psychometric Indicators of Perceived Academic Achievement.

Factor	Item	Factor Loadings	Cronbach's α
		1	
Perceived Academic Achievement	Y2	.982	0.991
	Y4	.980	
	Y5	.988	
	Y1	.981	
	Y3	.983	
Eigen Value		4.828	
Explained Variance (%)		96.559	
Cumulative Variance (%)		96.559	
KMO=0.901;Bartlett=5672.51;df=10;P=0.000			

In addition to exploratory factor analysis (EFA), confirmatory factor analysis (CFA) was conducted to further examine the measurement model. Since the four constructs comprised a relatively large number of items, item parceling was implemented to improve model fit, following the procedure recommended by Mathieu and Farr [85]. Specifically, EFA was first performed for each construct to obtain factor loadings, based on which the dimensional structure of each variable was identified. Items within the same sub-dimension were then aggregated into parcels. After parceling, the four-factor model—including self-determination motivation, goal orientation, self-regulated learning strategies, and perceived academic achievement—showed satisfactory fit indices: $\chi^2 = 131.29$, df = 35, $\chi^2/df = 3.751$ (< 5.00), RMSEA = 0.074 (< 0.08), RMR = 0.014 (< 0.08), CFI = 0.988 (> 0.90), and TLI = 0.981 (> 0.90). These findings indicate that the measurement model achieved acceptable discriminant validity among the constructs.

4.3. Correlation Analysis

The results of the correlation analysis are presented in Table 6. Self-determination motivation demonstrates significant positive associations with goal orientation (r = 0.664), self-regulated learning strategies (r = 0.368), and perceived academic achievement (r = 0.529). Goal orientation is also positively related to self-regulated learning strategies (r = 0.316) as well as perceived academic achievement (r = 0.448). Moreover, a positive

correlation is observed between self-regulated learning strategies and perceived academic achievement (r = 0.290).

Table 6. Results of Correlation Analysis.

Factor	Mean	Self-Determination Motivation	Goal Orientation	Self-Regulated Learning Strategies	Perceived Academic Achievement
Self-Determination Motivation	2.91	1			
Goal Orientation	3.11	.664**	1		
Self-Regulated Learning Strategies	2.49	.368**	.316**	1	
Perceived Academic Achievement	2.80	.529**	.448**	.290**	1
***$p<0.001$,**$p<0.01$,*$p<0.05$					

4.4. Direct Effects

Table 7 presents the findings for the direct path analysis. Self-determination motivation exerts significant positive effects on goal orientation (β = 0.826, $p < 0.001$), self-regulated learning strategies (β = 0.370, $p < 0.001$), and perceived academic achievement (β = 0.577, $p < 0.001$). In addition, goal orientation significantly predicts self-regulated learning strategies (β = 0.135, $p < 0.05$) as well as perceived academic achievement (β = 0.194, $p < 0.001$). Self-regulated learning strategies further demonstrate a significant positive influence on perceived academic achievement (β = 0.112, $p < 0.05$), as illustrated in Figure 2.

Table 7. Analysis of Direct Effects.

Path			β	SE	t	LLCI	ULCI
Self-Determination Motivation	→	Goal Orientation	0.826***	0.042	19.921	0.745	0.908
Self-Determination Motivation	→	Self-Regulated Learning Strategies	0.370***	0.072	5.119	0.228	0.512
Self-Determination Motivation	→	Perceived Academic Achievement	0.577***	0.076	7.550	0.427	0.727
Goal Orientation	→	Self-Regulated Learning Strategies	0.135*	0.058	2.316	0.020	0..249
Goal Orientation	→	Perceived Academic Achievement	0.194***	0.060	3.220	0.076	0.312

Self-Regulated Learning Strategies	→	Perceived Academic Achievement	0.112*	0.046	2.427	0.021	0.202

*p＜0.05, ***p＜0.001

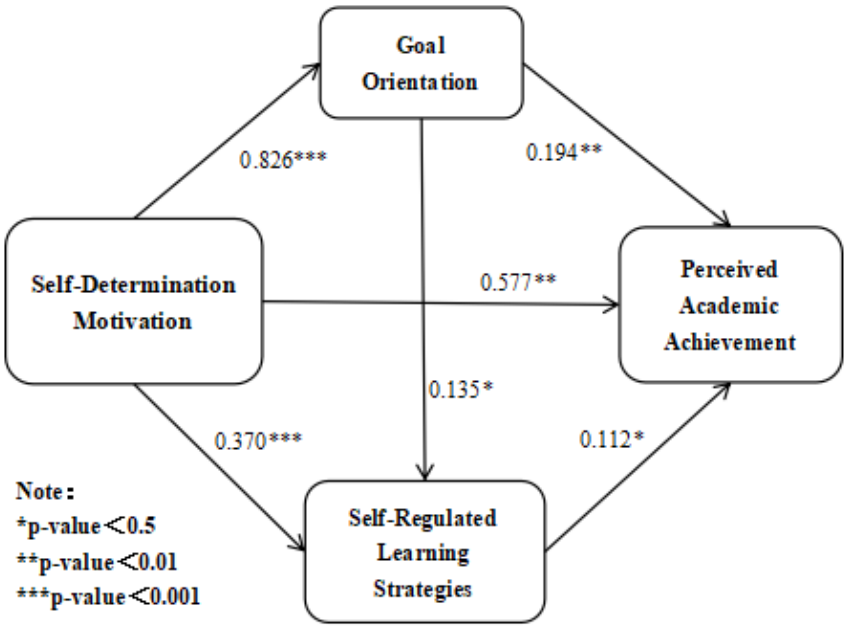

Figure 2. Direct Effects Analysis.

4.5. Indirect Effects

This study employed the bootstrap procedure proposed by Wen and Ye, generating 5000 resamples to examine the mediating effects among the variables, and the findings are reported in Table 8 [86]. In the pathway from self-determination motivation to cognitive academic achievement, the indirect effect through goal orientation produced a 95% confidence interval (CI) of [0.065, 0.268], accounting for 75% of the total indirect effect. The indirect pathway via self-regulated learning strategies yielded a 95% CI of [0.006, 0.086], representing 19%. In addition, the sequential mediation mechanism involving goal orientation followed by self-regulated learning strategies resulted in a 95% CI of [0.002, 0.032], contributing 6% of the overall indirect effect. Because none of the confidence intervals included zero, all indirect and sequential mediation effects were statistically significant.

Table 8. Analysis of Indirect Effects.

Pathway				Effect Size	Proportion of Effect	Boot SE	95% CI Lower Bound Boot LLCL	Boot ULCL
Self-Determination Motivation	→ Goal Orientation	→	Perceived Academic Achievement	0.160	75%	0.052	0.065	0.268
Self-Determination Motivation	→ Self-Regulated	→	Perceived Academic Achievement	0.041	19%	0.021	0.006	0.086

	Learning Strategies								
Self-Determination Motivation →	Goal Orientation →	Self-Regulated Learning Strategies →	Perceived Academic Achievement	0.012	6%	0.008	0.002	0.032
Total Indirect Effect				0.213	100%			

5. Discussion

Facilitating university students' effective use of short videos for learning and enhancing their academic outcomes through such platforms has become an important concern in higher education and society. This study examined how self-determination motivation influences cognitive academic achievement in knowledge-based short video learning, with goal orientation and self-regulated learning strategies functioning as mediators. Overall, the empirical findings provide support for the proposed hypotheses.

First, self-determination motivation was found to positively predict goal orientation, self-regulated learning strategies, and cognitive academic achievement, thereby supporting H1, H2, and H3. These findings are consistent with self-determination theory, which identifies autonomous motivation as a critical determinant of learning effectiveness in online contexts [9,38]. The results suggest that even within short video learning environments—often characterized by fragmented and informal content—students' autonomous motivation remains essential for fostering active and self-directed engagement. Notably, the effect of self-determination motivation on academic achievement ($\beta = 0.577$) exceeded that of goal orientation ($\beta = 0.194$) and self-regulated learning strategies ($\beta = 0.112$). Similarly, self-determination motivation exerted a stronger influence on self-regulated learning strategies than goal orientation did ($\beta = 0.370$ vs. $\beta = 0.135$), highlighting its foundational role.

Second, goal orientation demonstrated significant positive effects on both self-regulated learning strategies and cognitive academic achievement, confirming H4 and H5. This indicates that clearly defined learning goals can structure students' engagement with short video content, encouraging deeper strategy use and improving performance [18]. These findings are broadly consistent with Joo, Chung, and Choi [14], who observed that goal-oriented online learners are more likely to adopt diverse strategies to enhance learning experiences and outcomes. In addition, the positive association between self-regulated learning strategies and cognitive academic achievement (supporting H6) aligns with prior research conducted in online learning settings [21,23,87]. The present findings extend this conclusion to short video-based learning, suggesting that self-regulation remains effective even in emerging digital formats.

The mediation analysis further revealed that both goal orientation and self-regulated learning strategies play significant intermediary roles. Goal orientation partially explained how self-determination motivation enhances cognitive academic achievement, indicating that autonomous motivation strengthens students' goal structures, which in turn supports academic gains. This result echoes Cerasoli and Ford's findings regarding the motivational basis of goal orientation [17]. Likewise, self-regulated learning strategies functioned as a significant mediator, suggesting that motivated learners translate their autonomous drive into concrete regulatory behaviors, such as planning, monitoring, and adjusting their learning processes. These findings are consistent with prior studies emphasizing the role of self-regulation as a bridge between motivation and achievement [21,24,68], and they support H7 and H8.

When goal orientation and self-regulated learning strategies were examined simultaneously as sequential mediators, a significant chain mediation effect emerged

(supporting H9). Students with stronger autonomous motivation appear more likely to internalize learning goals, which subsequently encourages the adoption of multiple regulatory strategies. This process provides direction and structure to intrinsic motivation, facilitating more purposeful learning behaviors. The present study thus extends previous subject-specific short video research by clarifying the broader motivational mechanism underlying short video learning effectiveness. In particular, it underscores the central role of self-determination motivation as the driving force within this framework.

6. Conclusion

This study investigated the relationships among self-determination motivation, goal orientation, self-regulated learning strategies, and cognitive academic achievement within the context of knowledge-based short video learning among Chinese university students. While previous studies have explored short video learning, the broader role of self-determination motivation has received limited attention. The present findings indicate that self-determination motivation not only directly enhances academic achievement in short video learning but also indirectly contributes to achievement through its influence on goal orientation and self-regulated learning strategies. These results extend the application of self-determination theory to short video-based learning and enrich the theoretical understanding of motivation in emerging digital environments.

The study also provides practical implications. Since both goal orientation and self-regulated learning strategies contribute to improved cognitive academic achievement, difficulties encountered in short video learning may reflect weaknesses in these mechanisms. Interventions aimed at strengthening autonomous motivation could indirectly enhance goal setting and self-regulatory behaviors, thereby improving academic outcomes. Given the presence of both direct and indirect effects, goal orientation and self-regulated learning strategies function as partial mediators in the motivational pathway. Thus, while emphasizing the primary importance of self-determination motivation, this study highlights the interactive influence of multiple psychological factors in shaping learning outcomes in short video environments.

Despite its contributions, this study has several limitations. The sample was confined to university students with prior short video learning experience, which may limit generalizability. Future research should consider more diverse populations to improve external validity. Additionally, the cross-sectional design restricts conclusions about causal development over time. Longitudinal approaches could better capture changes in motivation, strategies, and achievement across learning stages. Finally, reliance on self-reported data may introduce bias; future studies could incorporate behavioral tracking or objective performance measures to enhance data accuracy.

Overall, this study provides empirical evidence regarding the motivational mechanisms underlying short video learning and offers a theoretical basis for promoting more rational and effective use of short video platforms in educational contexts.

Funding: This study was supported by the Ministry of Education's Humanities and Social Sciences Research Project, titled "The Mechanism of Pan-Knowledge Short Video Learning to Enhance College Students' Academic Achievement" (Grant No. 23YJC880021).

References

1. Z. Hanbin, "Telling Rural Stories Well: A Study on the Impact of Short Video-Based Teaching in College English Audio-Visual and Speaking Courses on Students' Oral Proficiency," *Frontiers in Educational Research*, vol. 8, no. 5, 2025. doi: 10.25236/FER.2025.080501.
2. E. J. Sintema, "Effect of COVID-19 on the performance of grade 12 students: Implications for STEM education," *EURASIA Journal of Mathematics, Science and Technology Education*, vol. 16, no. 7, p. em1851, 2020. doi: 10.29333/ejmste/7893.
3. Q. Zhou, "Understanding user behaviors of creative practice on short video sharing platforms-a case study of TikTok and Bilibili (Master's thesis, University of Cincinnati)," 2019.

4. J. Meng, and H. Zhao, "Report on the Status Quo and Development of Short-Form Video Research in China," In *Videolised Society*, 2023, pp. 277-324. doi: 10.1007/978-981-99-6419-2_20.
5. Y. Gao, "Research on Knowledge Dissemination of Short Video Platforms from the Perspective of Social Network Analysis-Take Bilibili as an Example," In *2023 9th International Conference on Humanities and Social Science Research (ICHSSR 2023)*, September, 2023, pp. 767-775. doi: 10.2991/978-2-38476-092-3_94.
6. H. Akhasbi, N. Belghini, and B. Riyami, "Self-determined learner motivation evaluation in distance learning context using Web 2.0 tools, during the COVID-19 pandemic period," in *INTED2021 Proc.*, 2021, pp. 2143–2151, doi: 10.21125/inted.2021.0466.
7. R. K. Malinauskas, and J. Pozeriene, "Academic motivation among traditional and online university students," *European journal of contemporary education*, vol. 9, no. 3, pp. 584-591, 2020. doi: 10.13187/ejced.2020.3.584.
8. Z. Zhou, and Y. Zhang, "Intrinsic and Extrinsic Motivation in Distance Education: A Self-Determination Perspective," *American Journal of Distance Education*, vol. 38, no. 1, pp. 51-64, 2024. doi: 10.1080/08923647.2023.2177032.
9. N. R. Salikhova, M. F. Lynch, and A. B. Salikhova, "Psychological Aspects of Digital Learning: A Self-Determination Theory Perspective," *Contemporary Educational Technology*, vol. 12, no. 2, p. ep280, 2020. doi: 10.30935/cedtech/8584.
10. X. Wei, N. Saab, and W. Admiraal, "Do learners share the same perceived learning outcomes in MOOCs? Identifying the role of motivation, perceived learning support, learning engagement, and self-regulated learning strategies," *The Internet and Higher Education*, vol. 56, p. 100880, 2023. doi: 10.1016/j.iheduc.2022.100880.
11. S. Siddiqui, N. S. Naureen, and T. Martin, "Blended learning as a source of satisfaction of psychological needs: An empirical study of O-level chemistry students in a metropolitan city of Pakistan," *Asian Association of Open Universities Journal*, vol. 15, no. 1, pp. 49–67, 2020, doi: 10.1108/AAOUJ-11-2019-0054.
12. C. Cardamone *et al*., "Use of short videos and case studies to enhance student confidence in biochemistry knowledge and application in a large lecture biochemistry course in first-year veterinary curriculum," *Biochemistry and Molecular Biology Education*, vol. 51, no. 2, pp. 164–170, 2023. doi: 10.1002/bmb.21705.
13. S. K. Ting, T. W. Lai, S. W. Yong, G. Subramaniam, and B. Dollery, "Short video clip production on learning performance: Evidence from university students," *International Journal of Innovation and Learning*, vol. 28, no. 4, pp. 415–429, 2020. doi: 10.1504/ijil.2020.110679.
14. Y. Joo, A. Chung, and M. Choi, "Identification of the structural relationship between goal orientation, teaching presence, approaches to learning, satisfaction and academic achievement of online continuing education learners," *The Journal of the Institute of Internet, Broadcasting and Communication*, vol. 16, no. 2, pp. 137–144, 2016. doi: 10.7236/JIIBC.2016.16.2.137.
15. Y. C. Yeh, O. M. Kwok, H. Y. Chien, N. W. Sweany, E. Baek, and W. A. McIntosh, "How college students' achievement goal orientations predict their expected online learning outcome: The mediation roles of self-regulated learning strategies and supportive online learning behaviors," *Online Learning*, vol. 23, no. 4, pp. 23–41, 2019. doi: 10.24059/olj.v23i4.2076.
16. Y. Liang, L. Ren, C. Wei, and Y. Shi, "The Influence of Internet-Specific Epistemic Beliefs on Academic Achievement in an Online Collaborative Learning Context for College Students," *Sustainability. 15(11):8938. doi:10.3390/su15118938*, 2023. doi: 10.3390/su15118938.
17. C. P. Cerasoli, and M. T. Ford, "Intrinsic Motivation, Performance, and the Mediating Role of Mastery Goal Orientation: A Test of Self-Determination Theory," *The Journal of Psychology*, vol. 148, no. 3, pp. 267-286, 2014. doi: 10.1080/00223980.2013.783778.
18. A. J. Elliot, and M. A. Church, "A hierarchical model of approach and avoidance achievement motivation," *Journal of Personality and Social Psychology*, vol. 72, pp. 218-232, 1997. doi: 10.1037//0022-3514.72.1.218.
19. M. L. Maehr, "Culture and achievement motivation," *International Journal of Psychology*, vol. 43, no. 5, pp. 917-918, 2008. doi: 10.1080/00207590701838162.
20. M. Boekaerts, "Self-regulated learning: Bridging the gap between metacognitive and metamotivation theories," *Educational Psychologist*, vol. 30, no. 4, pp. 195-200, 1995. doi: 10.1207/s15326985ep3004_4.
21. L. Xu, P. Duan, S. A. Padua, and C. Li, "The impact of self-regulated learning strategies on academic performance for online learning during COVID-19," *Frontiers in Psychology*, 2022. doi: 10.3389/fpsyg.2022.1047680.
22. Z. Xu, Y. Zhao, B. Zhang, J. Liew, and A. Kogut, "A meta-analysis of the efficacy of self-regulated learning interventions on academic achievement in online and blended environments in K-12 and higher education," *Behaviour & Information Technology*, 2023. doi: 10.1080/0144929x.2022.2151935.
23. J. Broadbent, "Comparing online and blended learners' self-regulated learning strategies and academic performance," *The Internet and Higher Education*, vol. 33, pp. 24–32, 2017. doi: 10.1016/j.iheduc.2017.01.004.
24. L. Barnard, V. Paton, and W. Lan, "Online Self-Regulatory Learning Behaviors as a Mediator in the Relationship between Online Course Perceptions with Achievement," *The International Review of Research in Open and Distributed Learning*, vol. 9, no. 2, 2008. doi: 10.19173/irrodl.v9i2.516.
25. X. L. Zhao, and J. Ma, "Analysis on the Interaction Characteristics of Users and Contents of Instant Video Based on the TikTok Application: Focusing on the Case of Chinese Men in Their Twenties," *Journal of The Korean Society Design Culture*, vol. 26, no. 2, p. 10, 2020. doi: 10.18208/ksdc.2020.26.2.527.
26. K. B. Kim and K. S. Kim, "A study on UCC video editing for sensibility delivery," *Journal of Digital Contents Society*, vol. 12, no. 4, pp. 449–456, 2011. doi: 10.9728/dcs.2011.12.4.449.

27. S. He, "The double effect of customer interaction in Chinese short video app: The mediating role of brand experience," *Perspective*, vol. 11, no. 11, pp. 2222–2839, 2019. doi: 10.7176/EJBM.
28. M. Z. Newman, "New media, young audiences and discourses of attention: From *Sesame Street* to 'snack culture'," *Media, Culture & Society*, vol. 32, no. 4, pp. 581–596, 2010. doi: 10.1177/0163443710367693.
29. Y. Zhang, M. Lucas, and L. Pedro, "A decade of short videos for foreign language teaching and learning: A review," *Education Sciences*, vol. 12, no. 11, article 786, 2022. doi: 10.3390/educsci12110786.
30. H. Kinnari-Korpela, "Using short video lectures to enhance mathematics learning: Experiences on differential and integral calculus course for engineering students," *Informatics in Education – An International Journal*, vol. 14, no. 1, pp. 69–83, 2015. doi: 10.15388/infedu.2015.05.
31. Q. Zea and H. Jung, "Learning and sharing creative skills with short videos: A case study of user behavior in TikTok and Bilibili," in *Proc. Int. Assoc. Soc. Des. Res. (IASDR), Design Revolution*, 2019.
32. F. Guay, R. J. Vallerand, and C. Blanchard, "On the assessment of situational intrinsic and extrinsic motivation: The Situational Motivation Scale (SIMS)," *Motivation and emotion*, vol. 24, no. 3, pp. 175-213, 2000. doi: 10.1023/a:1005614228250
33. E. L. Deci, and R. M. Ryan, "The general causality orientations scale: Self-determination in personality," *Journal of Research in Personality*, vol. 19, no. 2, pp. 109-134, 1985. doi: 10.1016/0092-6566(85)90023-6.
34. H. F. Harlow, "Learning and satiation of response in intrinsically motivated complex puzzle performance by monkeys," *Journal of Comparative and Physiological Psychology*, vol. 43, no. 4, pp. 289–294, 1950. doi: 10.1037/h0058114.
35. R. De Charms, "Personal causation: The internal affective determinants of behavior," *Routledge*, 2013. ISBN: 9781315825632.
36. M. Morgan, "Reward-induced decrements and increments in intrinsic motivation," *Review of Educational Research*, vol. 54, no. 1, pp. 5-30, 1984. doi: 10.3102/00346543054001005.
37. R. M. Ryan and J. P. Connell, "Perceived locus of causality and internalization: Examining reasons for acting in two domains," *Journal of Personality and Social Psychology*, vol. 57, no. 5, pp. 749–761, 1989. doi: 10.1037/0022-3514.57.5.749.
38. E. L. Deci and R. M. Ryan, "The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior," *Psychological Inquiry*, vol. 11, no. 4, pp. 227–268, 2000. doi: 10.1207/s15327965pli1104_01.
39. E. L. Deci and R. M. Ryan, *Intrinsic motivation and self-determination in human behavior*. Plenum Press, 1985. ISBN: 978-0306420221.
40. A. Bandura, *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall, 1986. ISBN: 9780138156145.
41. J. G. Nicholls, "Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance," *Psychological Review*, vol. 91, no. 3, pp. 328–346, 1984. doi:10.1037/0033-295X.91.3.328.
42. T. Hayamizu, "Between intrinsic and extrinsic motivation: Examination of reasons for academic study based on the theory of internalization," *Japanese psychological research*, vol. 39, no. 2, pp. 98-108, 1997. doi: 10.1111/1468-5884.00043.
43. K. C. Chen and S. J. Jang, "Motivation in online learning: Testing a model of self-determination theory," *Computers in Human Behavior*, vol. 26, no. 4, pp. 741–752, 2010. doi: 10.1016/j.chb.2010.01.011.
44. J. Yu, C. Huang, T. He, X. Wang, and L. Zhang, "Investigating students' emotional self-efficacy profiles and their relations to self-regulation, motivation, and academic performance in online learning contexts: A person-centered approach," *Education and Information Technologies*, vol. 27, no. 8, pp. 11715–11740, 2022, doi: 10.1007/s10639-022-11099-0.
45. J. Jeon, and S. Lee, "Teachers' use of motivational strategies in the synchronous online environment: A self-determination theory perspective," *Education and Information Technologies*, vol. 28, no. 9, pp. 11963-11986, 2023. doi: 10.1007/s10639-023-11656-1.
46. R. J. Vallerand, "Toward a hierarchical model of intrinsic and extrinsic motivation," *Advances in experimental social psychology*, vol. 29, pp. 271-360, 1997. doi: 10.1016/s0065-2601(08)60019-2.
47. H.-J. Liu, "Learner autonomy: The role of motivation in foreign language learning," *Journal of Language Teaching and Research*, vol. 6, no. 6, pp. 1165–1174, Nov. 2015. doi: 10.17507/jltr.0606.02.
48. C. Dong and B. Liu, "The relationship between self-determined motivation and school engagement for 8th grade students: The mediating effect of achievement goal," *Studies of Psychology and Behavior*, vol. 14, no. 1, pp. 57–64, 2016.
49. X. Lin and C.-H. Wang, "Achievement goal orientations and self–regulated learning strategies of adult and traditional learners," *New Horizons in Adult Education and Human Resource Development*, vol. 30, no. 4, pp. 5–22, 2018. doi: 10.1002/nha3.20229.
50. F. An, L. Xi, and J. Yu, "The relationship between technology acceptance and self-regulated learning: the mediation roles of intrinsic motivation and learning engagement," *Education and Information Technologies*, vol. 29, no. 3, pp. 2605-2623, 2024. doi: 10.1007/s10639-023-11959-3.
51. L. S. Teng, "Individual differences in self-regulated learning: Exploring the nexus of motivational beliefs, self-efficacy, and SRL strategies in EFL writing," *Language Teaching Research*, vol. 28, no. 2, pp. 366-388, 2024. doi: 10.1177/13621688211006881.
52. J. Reeve, "Understanding motivation and emotion," *New York: John Wiley & Sons*, 2014. ISBN: 9781118517796.
53. J. L. Meece, P. C. Blumenfeld, and R. H. Hoyle, "Students' goal orientations and cognitive engagement in classroom activities," *Journal of Educational Psychology*, vol. 80, no. 4, pp. 514-523, 1988. doi: 10.1037/0022-0663.80.4.514.
54. C. S. Dweck, "Motivational processes affecting learning," *American Psychologist*, vol. 41, no. 10, pp. 1040–1048, 1986. doi: 10.1037/0003-066X.41.10.1040.

55. E. S. Elliott and C. S. Dweck, "Goals: An approach to motivation and achievement," *Journal of Personality and Social Psychology*, vol. 54, no. 1, pp. 5–12, 1988. doi: 10.1037//0022-3514.54.1.5.
56. J. A. Eison, H. R. Pollio, and O. Milton, "Educational and personal characteristics of four different types of learning-and grade-oriented students," *Contemporary Educational Psychology*, vol. 11, no. 1, pp. 54–67, 1986. doi: 10.1016/0361-476X(86)90012-3.
57. C. Ames, and J. Archer, "Achievement goal in the classroom: Students' learning strategies and motivation processes," *Journal of Educational Psychology*, vol. 80, no. 3, pp. 260-267, 1988. doi: 10.1037/0022-0663.80.3.260.
58. E. A. Linnenbrink and P. R. Pintrich, "Motivation as an enabler for academic success," *School Psychology Review*, vol. 31, no. 3, pp. 313–327, 2002. doi: 10.1080/02796015.2002.12086158.
59. B. Weiner, "An attributional theory of achievement motivation and emotion," *Psychological Review*, vol. 92, no. 4, pp. 548–573, 1985. doi: 10.1037/0033-295X.92.4.548.
60. B. Bulter, "Task-involving and ego - involving properties of evaluation: Effect of different feedback conditions on Motivational perceptions, interest, and performance," *Journal of educational Psychology*, vol. 79, no. 4, pp. 474-482, 1987. doi: 10.1037/0022-0663.79.4.474.
61. C. Ames, "Classrooms: Goals, structures, and student motivation," *Journal of Educational Psychology*, vol. 84, no. 3, pp. 261–271, 1992. doi: 10.1037/0022-0663.84.3.261
62. J. G. Nicholls, *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press, 1989. ISBN: 9780674154179.
63. M. A. Flores, A. M. Veiga Simão, P. C. Ferreira, D. Pereira, A. Barros, P. Flores, and L. Costa, "Online learning, perceived difficulty and the role of feedback in COVID-19 times," *Research in Post-Compulsory Education*, vol. 29, no. 2, pp. 324–344, 2024. doi: 10.1080/13596748.2024.2330784.
64. G. Heilporn, S. Lakhal, and M. Bélisle, "Blended online courses: Students' learning experiences and engaging instructional strategies," *Pedagogies: An International Journal*, vol. 19, no. 2, pp. 233–256, 2024. doi: 10.1080/1554480x.2023.2219255.
65. Y. Zhou and J. Wang, "Goal orientation, learning strategies, and academic performance in adult distance learning," *Social Behavior and Personality: An International Journal*, vol. 47, no. 7, pp. 1–20, 2019. doi: 10.2224/sbp.8195.
66. D. H. Schunk, "Social cognitive theory and self-regulated learning," in *Research on Motivation in Education*, C. Ames and R. Ames, Eds., vol. 3, San Diego, CA: Academic Press, 1989, pp. 1–53, ISBN: 9781461281801.
67. P. R. Pintrich, and E. V. D. Groot, "Motivational and self-regulated learning components of classroom academic performance," *Journal of Educational Psychology*, vol. 82, pp. 33-40, 1990. doi: 10.1037//0022-0663.82.1.33.
68. B. J. Zimmerman, "A Social cognitive view of self-regulated academic learning," *Journal of Educational Psychology*, vol. 81, pp. 329-339, 1989. doi: 10.1037/0022-0663.81.3.329.
69. J. Broadbent and W. L. Poon, "Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review," *The Internet and Higher Education*, vol. 27, pp. 1–13. doi: 10.1016/j.iheduc.2015.04.007.
70. E. Loeb, and N. M. Hurd, "Subjective social status, perceived academic competence, and academic achievement among underrepresented students," *Journal of College Student Retention: Research, Theory & Practice*, vol. 21, no. 2, pp. 150-165, 2019. doi: 10.1177/1521025117696821.
71. W. Zheng, P. Akaliyski, C. Ma, and Y. Xu, "Cognitive flexibility and academic performance: Individual and cross-national patterns among adolescents in 57 countries," *Personality and Individual Differences*, vol. 217, p. 112455, 2024. doi: 10.1016/j.paid.2023.112455.
72. Y. Tao, Y. Meng, Z. Gao, and X. Yang, "Perceived teacher support, student engagement, and academic achievement: a meta-analysis," *Educational Psychology*, vol. 42, no. 4, pp. 401-420, 2022. doi: 10.1080/01443410.2022.2033168.
73. J. M. Scoulas, K. Shotick, G. S. L. De, and N. L. Osorio, "Developing and Validating Assessment Tools for Measuring Undergraduate Students' Academic Engagement and Academic Achievement: Lessons Learned from a Pilot Research Project," *Journal of Library Administration*, vol. 64, no. 2, pp. 243-251, 2024. doi: 10.1080/01930826.2024.2305075.
74. J. Piaget, "Intellectual evolution from adolescence to adulthood," *Human Development*, vol. 15, no. 1, pp. 1-12, 1972. doi: 10.1159/000271225
75. T. R. Guskey, "Closing Achievement Gaps: Revisiting Benjamin S," *Bloom's "Learning for Mastery". Journal of Advanced Academics*, vol. 19, no. 1, pp. 8-31, 2007. doi: 10.4219/jaa-2007-704.
76. S. Barzilai, and I. Blau, "Scaffolding game-based learning: Impact on learning achievements, perceived learning, and game experiences," *Computers & Education*, vol. 70, pp. 65-79, 2014. doi: 10.1016/j.compedu.2013.08.003.
77. J. Metcalfe, "Metacognitive judgments and control of study," *Current Directions in Psychological Science*, vol. 18, no. 3, pp. 159-163, 2009. doi: 10.1111/j.1467-8721.2009.01628.x
78. J. L. Chesebro and J. C. McCroskey, "The relationship between students' reports of learning and their actual recall of lecture material: A validity test," *Communication Education*, vol. 19, no. 3, pp. 237–301, 2000. doi: 10.1080/03634520009379217.
79. E. Top, "Blogging as a social medium in undergraduate courses: Sense of community best predictor of perceived learning," *The Internet and Higher Education*, 2012. doi: 10.1016/j.iheduc.2011.02.001

80. S. P. León, A. Pantoja Vallejo, and J. B. Nelson, "Variability in the accuracy of self-assessments among low, moderate, and high performing students in university education," *Practical Assessment, Research & Evaluation*, vol. 26, no. 1, art. 16, Jun. 2021, doi: 10.7275/6q91-az58.
81. M. Tan and T. S. Teo, "Factors influencing the adoption of Internet banking," *Journal of the Association for Information Systems*, vol. 1, no. 1, p. 5, 2000. doi: 10.17705/1jais.00005.
82. L. J. Cronbach, "Coefficient alpha and the internal structure of tests," *Psychometrika*, vol. 16, no. 3, pp. 297-334, 1951. doi: 10.1007/bf02310555.
83. J. C. Nunnally, "Psychometric theory-25 years ago and now," *Educational Researcher*, vol. 4, no. 10, pp. 7-21, 1975. doi: 10.3102/0013189X004010007.
84. C. D. Dziuban, and E. C. Shirkey, "When Is a Correlation Matrix Appropriate for Factor Analysis? Some Decision Rules," *Psychological Bulletin*, vol. 81, pp. 358-361, 1974. doi: 10.1037/h0036316.
85. J. E. Mathieu, and J. L. Farr, "Further evidence for the discriminant validity of measures of organizational commitment, job involvement, and job satisfaction," *Journal of Applied Psychology*, vol. 76, no. 1, pp. 127-133, 1991. doi: 10.1037/0021-9010.76.1.127.
86. Z. Wen and B. Ye, "Analyses of mediating effects: The development of methods and models," *Advances in Psychological Science*, vol. 22, no. 5, p. 731, 2014. doi: 10.3724/SP.J.1042.2014.00731.
87. Y. Zheng and Y. Bai, "An Empirical Study on Time Management of Vocational College Students—A Case Study of Hainan College of Economics and Business," in *Proc. 2022 International Conference on Educational Innovation and Multimedia Technology (EIMT 2022)*, 2022, pp. 742–752. doi: 10.2991/978-94-6463-012-1_81