Journal of Curriculum Studies Research

https://curriculumstudies.org

E-ISSN: 2690-2788

Volume: 8 Issue: 2 2026

pp. 364-388

Video-Based Learning, Flipped Classroom, and Motivation to Improve Problem-Solving Life Skills of Students with Disabilities in Inclusive Schools

Wiwik Widajati[*a] & Pamuji[a]

* Corresponding author
Email: wiwikwidajati@unesa.ac.id
a. Department of Special Education, Faculty of Education, Universitas Negeri Surabaya, Surabaya, Indonesia

Article Info
Received: April 15, 2026
Accepted: August 25, 2026
Published: September 1, 2026

10.46303/jcsr.2026.37

How to cite
Widajati, W., & Pamuji, P. (2026). Video-Based Learning, Flipped Classroom, and Motivation to Improve Problem-Solving Life Skills of Students with Disabilities in Inclusive Schools. *Journal of Curriculum Studies Research*, *8*(2), 364-388. https://doi.org/10.46303/jcsr.2026.37

Copyright license
This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International license.

ABSTRACT
The 21st century requires individuals to have essential life skills, especially contextual problem-solving skills for independent living. However, students with disabilities often face obstacles in developing these skills due to the limited availability of engaging, technology-based learning strategies. This study aims to analyze the effectiveness of combining video-based learning and the flipped classroom approach in improving students' problem-solving life skills in inclusive schools in Indonesia. The study used a quasi-experimental 2×2 factorial design and a pretest–posttest non-equivalent control group model, involving 68 junior high school students. Data were collected using life skills and motivation scales and then analyzed using two-way ANOVA at a 5% significance level. The results showed significant effects of learning strategies, motivation, and their interaction on problem-solving skills. Students who participated in video-based learning with a flipped classroom approach showed a greater increase in problem-solving skills than those who did not. These findings indicate that integrating video-based learning and the flipped classroom effectively improves problem-solving life skills and fosters a more interactive, student-centered, and inclusive learning environment.

KEYWORDS
Video-based learning; flipped classroom; problem-solving skills; motivation; inclusive education.

INTRODUCTION

At the international level, the United Nations and its affiliated organizations, such as UNESCO, emphasize inclusive and equitable quality education as a fundamental goal of global educational development (UNESCO, 2017). UNESCO's Education 2030 Framework for Action highlights the importance of leveraging digital technologies and innovative learning strategies to ensure inclusive education and lifelong learning opportunities for all learners, including students with disabilities (UNESCO, 2016). The trend in 21st-century education is increasingly oriented toward digital technology–based learning strategies and media so that students (both with disabilities and typically developing students) can construct knowledge, particularly in problem-solving skills, through reflective and divergent thinking (Edwin et al., 2025). Moreover, constructing knowledge related to life skills in problem-solving requires learning strategies and media that facilitate learning for students (with disabilities and typical students), so that the process is directed toward more optimal and comprehensive learning outcomes (Kantathanawat et al., 2025).

The new paradigm of learning views learning as the construction of knowledge from concrete experiences, collaborative activities, reflection, and interpretation of events and objects in the real world. These strategies and media are expected to improve life skills in problem-solving, quality of life, academic achievement, and social competence by emphasizing interaction, collaboration, and empathy toward others (Sasanti, 2025). However, the use of real-life problems as learning resources remains suboptimal. Students (with disabilities and typically developing) are rarely allowed to construct knowledge actively, resulting in rote-based learning and less meaningful outcomes, especially in learning related to life skills and problem-solving in daily life (Kanthimathi & Raja, 2025).

A good understanding of life skills in problem-solving enables students to respond to and address various daily problems more effectively (Maqsood et al., 2022). Similarly, many typical students encounter difficulties due to several factors, particularly when the applied learning strategies do not align with their needs and characteristics. A preliminary study in inclusive schools in Surabaya, Indonesia, revealed various problems in life-skill–based problem-solving learning. Learning strategies tend to be monotonous and fail to engage students (Qehaja & Kida, 2025; Ubabuddin, 2020) actively. Learning media are also less varied, making learning less interesting and difficult to understand for students with intellectual disabilities, slow learners, and typical students. As a result, students tend to be passive, easily bored, and able only to memorize concepts rather than truly understand life skills and problem-solving (Anas et al., 2025; Rahmawati et al., 2025).

This condition emphasizes the importance of more interactive and engaging learning strategies to improve students' life-skill problem-solving abilities (Rahmatullah et al., 2025). The combination of video-based learning and the flipped classroom approach, supported by student motivation, is expected to provide an effective solution for learning life-skill problem-solving for both students with disabilities and typical students. In addition, video-based learning combined

with the flipped classroom approach can foster collaboration and social interaction among students, enabling them to learn together and help one another (Arsyad et al., 2025). Through this approach, learning materials related to life-skill problem-solving become clearer, social skills improve, and learning becomes more concrete and engaging (Rahayu et al., 2025).

The success of life skill–based problem-solving learning can be influenced by the selection of appropriate learning strategies and media (Qotrunnada, 2022). Meaningful learning strategies must be supported to develop life-skill problem-solving, an essential component of learning because it equips students (both with disabilities and typically developing) to face real-life challenges. Therefore, teachers should facilitate learning by applying suitable strategies and media. Life-skill problem-solving is important to teach in inclusive schools so that students acquire the necessary competencies to effectively face and solve daily problems (Arrasyid, 2023). Meaningful learning strategies, combined with technology-based media aligned with technological developments, can facilitate this process, including video-based learning and the flipped classroom approach. Video-based learning can improve students' knowledge, foster divergent thinking, and make learning more enjoyable (Romadhon et al., 2024).

The flipped classroom model begins with students studying materials independently at home before attending class, where they complete tasks and engage in discussions on the topics covered (Diahyleva et al., 2023). It allows students to learn more easily, increases their retention, and improves their learning outcomes. The flipped classroom enhances students' independent learning, problem-solving abilities, and collaboration skills (Soetra et al., 2025).
Motivation influences the paths individuals choose and the goals they set for themselves (Sunarti et al., 2018). It represents the willingness to invest effort and resources in specific behaviors, directing attention and energy toward academic success, fostering self-efficacy, and helping students persevere in challenges (Tomar et al., 2024). Previous studies related to this research have shown that learning strategies and motivation play essential roles in improving students' learning outcomes and performance, including life-skill-based problem-solving in everyday life. This research aims to examine and verify the influence of learning strategies and motivation on life-skill problem-solving outcomes among students in inclusive schools. Additionally, it seeks to identify the extent to which this strategy can improve students' attitudes, particularly in courage, honesty, and discipline, as well as performance aspects such as accuracy, responsibility, and collaboration. This study also seeks to provide empirical evidence to inform teachers and schools in implementing more interactive and effective learning strategies, so that life skill-based problem-solving learning for both students with disabilities and typical students becomes more engaging and better suited to their needs and characteristics.

Recent evidence from systematic reviews and meta-analyses further strengthens the rationale for implementing video-based learning and the flipped classroom in education. A systematic review by Naing et al. (2023) demonstrated that flipped classroom pedagogy generally improves students' academic achievement, learning satisfaction, and engagement

compared with conventional instruction. However, its effectiveness depends on the quality of instructional design and the implementation of active learning. Furthermore, a second-order meta-analysis by Li et al. (2025), synthesizing evidence from 38 prior meta-analyses involving more than 333,000 learners, confirmed that flipped learning consistently yields positive effects on learning outcomes across diverse educational contexts. Nevertheless, limited evidence has examined the integrated effects of video-based learning, flipped classroom, and students' motivation on life-skill problem-solving in inclusive secondary education, particularly among students with disabilities and their typically developing peers. Therefore, the present study addresses this research gap by investigating the effectiveness of this integrated instructional approach in fostering life-skill problem-solving within inclusive school settings.

The novelty of this research lies in combining the video-based learning strategy with the flipped classroom approach to motivate the development of life-skill problem-solving for students with disabilities. Unlike most conventional strategies that rarely integrate digital media and motivational aspects, this combination is crucial for optimizing life-skill problem-solving among students with disabilities. The integrated use of video-based learning and flipped classroom strategies is expected to make learning more engaging, provide better visualization of the learning material, and ultimately optimize students' learning outcomes in life-skill problem-solving, an essential competence for the 21st century. Accordingly, this study investigates the effects of video-based learning integrated with the flipped classroom approach and students' learning motivation on life-skill problem-solving performance among students in inclusive secondary schools. Specifically, the study examines the main effects of learning strategy and motivation, as well as their interaction effect, using a 2 × 2 factorial quasi-experimental design.

Accordingly, this study addresses the following research questions:

RQ1. Does the learning strategy, namely video-based learning integrated with the flipped classroom approach, significantly affect students' life-skill problem-solving performance in inclusive secondary schools?

RQ2. Does students' learning motivation significantly affect their life-skill problem-solving performance in inclusive secondary schools?

RQ3. Is there a significant interaction effect between the learning strategy and students' learning motivation on life-skill problem-solving performance in inclusive secondary schools?

Based on the theoretical framework and previous empirical findings, the present study proposes the following hypotheses:

H1. Students who learn through video-based learning integrated with the flipped classroom approach will demonstrate significantly higher life-skill problem-solving performance than students who learn through video-based learning without the flipped classroom approach.

H2. Students with high learning motivation will demonstrate significantly higher performance in life-skill problem-solving than students with low learning motivation.

H3. There is a significant interaction effect between learning strategy and learning motivation on students' life-skill problem-solving performance in inclusive secondary schools.

LITERATURE REVIEW

Life Skills and Problem-Solving

In the 21st century, education has shifted from content delivery to the cultivation of essential life skills, including critical and creative thinking, collaboration, social responsibility, and self-regulated learning (Rohmah et al., 2025). Among these, problem-solving stands as a central competency; it involves recognizing gaps between current and desired states, generating and implementing solutions, and reflecting on outcomes (Hu & Shu, 2025). This process demands cognitive, metacognitive, interpersonal, and intrapersonal engagement. In inclusive contexts, problem-solving takes on an ethical dimension, ensuring that learners with disabilities develop autonomy, decision-making capacity, and self-efficacy. A life-skills-oriented pedagogy therefore emphasizes authentic, collaborative, reflective, and learner-centered experiences that enable all students to thrive in complex and uncertain real-world environments.

Video-Based Learning (VBL)

Video-Based Learning has become a key innovation in digital education because it integrates visual and auditory channels to enhance comprehension and retention. Grounded in Mayer's Cognitive Theory of Multimedia Learning (CTML), effective instructional videos reduce cognitive overload and are segmented. In inclusive classrooms, VBL offers flexibility and accessibility features, such as pause, replay, and playback speed adjustments, that allow students, particularly those with disabilities, to learn at their own pace. Empirical studies confirm that video integration improves learning outcomes, reasoning ability, and motivation. When combined with flipped classroom pedagogy, videos serve as pre-class scaffolds, helping students grasp foundational knowledge before engaging in collaborative, problem-based activities. Thus, VBL is not merely a delivery tool but a catalyst for reflection, engagement, and the development of higher-order life skills.

Flipped Classroom (FC)

The flipped classroom redefines the traditional teaching model by shifting direct instruction to pre-class digital engagement, typically through videos, and dedicating classroom time to interactive learning, such as projects, discussions, and problem-solving (Maulana et al., 2016). Rooted in constructivism and Self-Determination Theory (SDT), the flipped classroom approach enhances students' autonomy, competence, and social relatedness by promoting active, self-directed learning (Huang & Chang, 2024; Muhuro & Kang'ethe, 2025; Muir, 2021). Furthermore, empirical evidence consistently demonstrates that flipped classroom pedagogy improves analytical reasoning, self-regulation, student participation, and learning engagement across diverse educational settings, including inclusive learning environments (Li et al., 2025; Naing et al., 2023).In inclusive education, this model supports differentiated instruction: students can review content independently, while teachers focus on personalized guidance during class. To

be effective, FC design must align with Cognitive Load Theory (CLT); materials should be concise, segmented, and cognitively accessible. The integration of FC and VBL creates a continuous learning cycle (pre-class preparation, in-class collaboration, post-class reflection) that strengthens both cognitive and social skills.

Motivation in Learning

Motivation functions as the psychological engine of learning. According to SDT, motivation thrives when learners' needs for autonomy, competence, and relatedness are fulfilled. Highly motivated students engage in deeper cognitive processing, persist longer, and employ more effective problem-solving strategies. For learners with disabilities, motivational supports such as offering meaningful choices, acknowledging students' efforts, and providing constructive feedback can reduce learning anxiety, strengthen resilience, and promote sustained engagement by satisfying students' needs for autonomy, competence, and relatedness (Deci & Ryan, 2000; UNESCO, 2017). Recent evidence also indicates that autonomy-supportive instructional practices and positive teacher feedback contribute to greater academic resilience, motivation, and participation among students with diverse learning needs (Maddens et al., 2023; Sharma & Ghosh, 2023). In inclusive classrooms, motivation bridges external teaching strategies (such as VBL and FC) and internal outcomes, reinforcing both engagement and self-efficacy.

The Integrative Framework

Building upon the complementary roles of CTML, CLT, SDT, and EVT, this integrative framework unites cognitive, technological, motivational, and inclusive dimensions into a coherent model for developing students' life-skill problem-solving skills (Huang & Chang, 2024; Mokhampanyane, 2024).

The four theoretical perspectives adopted in this study are not treated as independent explanatory frameworks but as complementary foundations that collectively explain how students develop life-skill problem-solving skills in inclusive learning environments. The Cognitive Theory of Multimedia Learning (CTML) explains how video-based learning facilitates meaningful cognitive processing by integrating visual and auditory information, while CLT emphasizes minimizing unnecessary cognitive demands during learning. Building on these cognitive foundations, the flipped classroom provides opportunities for students to apply acquired knowledge through collaborative, problem-centered activities. The effectiveness of this learning process, however, depends on students' motivational readiness. Therefore, SDT explains how autonomy, competence, and relatedness foster intrinsic motivation. In contrast, Expectancy–Value Theory (EVT) explains how students' expectations of success and the perceived value of learning tasks influence their persistence and engagement. Together, these theoretical perspectives form an integrated conceptual framework in which cognitive support (CTML and CLT) enhances learning processes, motivational mechanisms (SDT and EVT) sustain engagement, and their interaction ultimately promotes students' life-skill problem-solving performance in inclusive education.

These pillars interact dynamically: cognitive engagement through VBL and FC fuels motivation; motivation sustains persistence in problem-solving; and inclusion provides an equitable environment in which all learners can participate meaningfully. This cyclical reinforcement aligns with UN Sustainable Development Goal 4 (SDG 4) on quality and inclusive education.

RESEARCH METHOD

Research Design

The research design employed in this study was a quasi-experimental pretest–posttest non-equivalent control group design. This design was selected to determine the effect of the independent variables on the dependent variable while accommodating the practical constraints of conducting controlled experiments in real educational settings. The experimental framework used a 2 × 2 factorial design, in which two independent variables were manipulated: (1) learning strategy (video-based learning with flipped classroom versus video-based learning without flipped classroom) and (2) student motivation (high versus low) to examine their individual and interaction effects on the dependent variable, life-skill problem-solving. A factorial design allows for simultaneous investigation of multiple independent variables and their combined influence on learning outcomes, enhancing the analytical precision and interpretive depth of the study (Krishnan, 2021).

Prior to the intervention, both groups completed a pre-test measuring life-skill problem-solving. An independent-samples t-test revealed no statistically significant difference between the experimental and control groups ($p > .05$), indicating comparable baseline performance before the intervention.

Participants and Data Collection

The participants were 68 tenth-grade students from two public inclusive secondary schools in East Java, Indonesia. The schools were selected because they had officially implemented inclusive education and enrolled students with disabilities alongside typically developing students. Of the 68 participants, eight were identified as students with disabilities, including three with hearing impairments, two with mild intellectual disabilities, two with autism spectrum disorder, and one with physical disabilities. Data were collected through pretest, intervention sessions using video-based learning with a flipped classroom approach, and posttest assessment. Participants were selected based on preliminary studies indicating the need for learning strategies and media aligned with the needs and characteristics of students with disabilities. Teachers and school principals also served as secondary data sources through structured interviews to identify prior instructional conditions and contextual learning challenges. Before data collection, informed consent was obtained from all participants, and parental or legal guardian consent was obtained for students under 18. Participation was voluntary; participants could withdraw at any time, and confidentiality and anonymity were maintained throughout the research process. The participants were Grade 10 students aged 15

to 18 years. The sample consisted of 36 females and 32 males. Socioeconomic status was relatively homogeneous because all participants attended public inclusive secondary schools in the same district. The experimental and control groups were assigned to existing intact classrooms because random assignment was not feasible in the school setting. To ensure baseline equivalence, the same physics teacher taught both groups, followed the same curriculum, received instruction during the same semester, and completed a pre-test prior to the intervention. An independent-samples t-test confirmed that there was no statistically significant difference between the two groups before treatment ($p > .05$).

Research Instruments

Data were collected using two primary instruments: (1) a life-skill problem-solving assessment scale and (2) a motivation rating scale. The problem-solving scale assessed indicators such as identifying problems, determining causes, selecting alternative solutions, implementing and evaluating solutions, and overcoming barriers. The motivation scale was designed to assess students' intrinsic and extrinsic motivation in learning contexts. Experts in inclusive education validated both instruments, which were then pilot-tested to confirm their reliability and construct validity.

Prior to the main study, all research instruments were piloted with students from an inclusive secondary school who were not part of the main experiment. The pilot study demonstrated satisfactory psychometric properties. The internal consistency of the life-skill problem-solving instrument was high (Cronbach's $\alpha = 0.89$), while the learning motivation questionnaire achieved a Cronbach's α of 0.91. Item discrimination indices ranged from 0.36 to 0.74, indicating acceptable to good discriminative power. Test–retest reliability conducted over a two-week interval also showed satisfactory stability ($r = 0.87$).

Data Analysis

Quantitative data analysis was conducted using a two-way ANOVA (Analysis of Variance) at the 5% significance level ($\alpha = 0.05$) to test the main and interaction effects of instructional strategy and motivation on students' life-skill problem-solving performance. The analysis aimed to interpret the observed statistical variations and provide a comprehensive understanding of changes that occurred during the learning process. Effect sizes were also calculated to determine the magnitude of the intervention's impact. This analytical approach is consistent with recent educational research evaluating the effectiveness of teaching models in inclusive contexts. The findings from this analytical framework are expected to provide empirical insights into how video-based learning, combined with flipped classroom pedagogy and student motivation, can enhance the problem-solving life skills of both students with disabilities and their typical peers in inclusive school environments. Ultimately, this methodological design provides a strong basis for validating the theoretical framework proposed in this study.

Prior to conducting the two-way ANOVA, the assumptions of normality, homogeneity of variance, and baseline group equivalence were examined. The Shapiro–Wilk test indicated that the dependent variable was normally distributed across all groups ($p > .05$), supporting the

assumption of normality. Homogeneity of variance was assessed using Levene's test, which showed that the variances did not differ significantly among groups ($p > .05$), indicating that the homogeneity assumption was satisfied. Because intact classes were used, baseline equivalence between the experimental and control groups was examined using an independent-samples t-test on the pre-test scores. The analysis revealed no statistically significant difference between the groups ($p > .05$), indicating comparable initial ability prior to the intervention.

Prior to the main statistical analysis, the assumptions underlying two-way ANOVA were evaluated. Data normality was assessed using the Shapiro–Wilk test, homogeneity of variance was examined using Levene's test, and baseline equivalence between the experimental and control groups was evaluated through an independent-samples t-test based on the pre-test scores. The results indicated that all assumptions were satisfied ($p > .05$), supporting the use of two-way ANOVA for hypothesis testing.

Implementation Process

The intervention was conducted over eight weeks, comprising 16 instructional sessions. Each session lasted 90 minutes (2 × 45 minutes) and was conducted twice per week. The instructional videos covered Newton's Laws, Work and Energy, Momentum and Impulse, and Circular Motion. The videos were developed by the researchers using PowerPoint animations and narrated explanations. Each video lasted approximately 10–15 minutes. The instructional videos were designed in accordance with Universal Design for Learning (UDL) principles, providing multiple means of representation through narration, animations, diagrams, subtitles, and real-life examples to accommodate diverse learners. Before each classroom meeting, students in the experimental group independently watched the assigned instructional videos and completed a short preparatory worksheet. During classroom sessions, the teacher facilitated collaborative discussions, guided problem-solving activities, provided feedback, and encouraged peer interaction to reinforce conceptual understanding. Students in the control group received conventional teacher-centered instruction consisting of classroom lectures, textbook explanations, question-and-answer sessions, and individual exercises. No pre-class instructional videos or flipped learning activities were implemented.

RESULTS

The results are organized according to the three research questions formulated in this study. First, the results address RQ1 by examining the effect of the learning strategy, namely video-based learning integrated with the flipped classroom approach, on students' life-skill problem-solving performance. Second, the results address RQ2 by examining the effect of students' learning motivation on life-skill problem-solving performance. Third, the results address RQ3 by examining the interaction between learning strategy and learning motivation. The two-way ANOVA results, descriptive findings, and interaction patterns are presented sequentially to provide statistical evidence for answering each research question.

The statistical analysis of this research employed two-way Analysis of Variance (ANOVA) to determine the main and interaction effects of learning strategy and motivation on the development of students' life-skill problem-solving abilities in inclusive schools. As shown in Table 1, the results indicated a statistically significant influence of both learning strategy and motivation, as well as their interaction, on students' outcomes. Specifically, the learning strategy yielded $F(1, 62) = 15.97$, $p < .001$, motivation produced $F(1, 62) = 10.40$, $p = .002$, and the interaction between both variables recorded $F(1, 62) = 9.97$, $p = .002$. These results collectively suggest that the combination of video-based learning and flipped classroom pedagogy, when coupled with students' motivational levels, significantly enhances the development of problem-solving life skills. The corrected R^2 value of .353 (adjusted $R^2 = .324$) further confirms that approximately 32% of the total variance in students' problem-solving ability can be explained by these variables. This effect size indicates a moderate-to-strong influence, affirming the pedagogical value of integrating digital media and motivationally engaging instruction in inclusive learning environments (Arrahmat et al., 2025).

Table 1.

Two-way ANOVA results for life-skill problem-solving

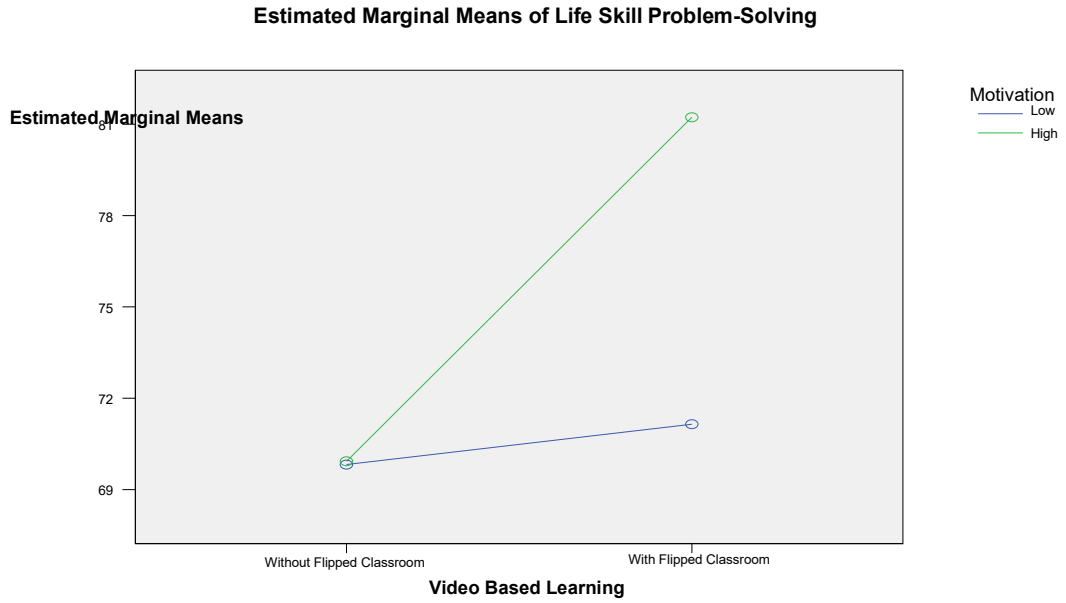
Tests of Between-Subjects Effects					
Dependent Variable: Life-Skill Problem-solving					
Source	Type III Sum of Squares	Df	Mean Square	*F*	Sig.
Corrected Model	1410.424	3	470.141	11.508	0.000
Intercept	348985.559	1	348985.559	8542.394	0.000
Video Based Learning	652.360	1	652.360	15.968	0.000
Motivation	424.907	1	424.907	10.401	0.002
Video Based Learning * Motivation	407.230	1	407.230	9.968	0.002
Error	2573.762	62	40.853		
Total	358549.500	67			
Corrected Total	3984.187	67			
R Squared = .353 (Adjusted R Squared = .324)					

The results of a two-way ANOVA showed a significant interaction effect between learning strategies and motivation on life-skill problem-solving abilities ($p = .002$). This finding indicates that the effectiveness of video-based flipped learning is not uniform across all students, but rather depends heavily on the level of learning motivation. In the group receiving video-based flipped classroom instruction, students with high motivation achieved significantly higher problem-solving scores ($M = 81.23$) than students with low motivation ($M = 71.15$). Conversely, in the control group receiving only video-based learning without flipped instruction, the difference in scores based on motivation was barely visible (high motivation: $M = 69.93$; low motivation: $M = 69.82$). This pattern confirms that flipped classrooms have the strongest impact

when students have high motivational readiness, while with low motivation the improvement tends to be limited.

Figure 1.

Estimated marginal means of life-skill problem-solving as a function of motivation and learning strategy.



The findings demonstrate that students exposed to video-based learning combined with flipped classroom instruction outperformed those who learned only through conventional video-based learning without the flipped component. These results align with the notion that flipped classrooms restructure learning by shifting lower-order cognitive activities outside the classroom and emphasizing higher-order problem-solving during face-to-face sessions. The video-based pre-learning phase enabled students to acquire conceptual knowledge independently, whereas collaborative in-class activities promoted deeper understanding through peer interaction and teacher facilitation. This pedagogical synergy fostered greater cognitive engagement, self-regulation, and reflective reasoning among students. Moreover, learning motivation served as a key amplifier, with highly motivated students demonstrating greater persistence, self-direction, and willingness to explore alternative problem-solving strategies, supporting the view that intrinsic motivation enhances metacognitive effort and learning outcomes. These quantitative findings were further supported by structured classroom observations, which consistently showed that students in the experimental group exhibited higher levels of active participation, collaborative discussion, task engagement, and independent problem-solving than those in the control group throughout the intervention. The observation data were analyzed descriptively, using mean scores for each observation indicator across all instructional sessions, and served to triangulate the quantitative findings, providing complementary evidence of the instructional intervention's effectiveness.

Beyond the statistical significance, the interaction effect between learning strategy and motivation holds theoretical importance. The *p*-value of .002 (< .05) for the interaction term implies that the influence of the instructional strategy depends on the learner's motivational state. Highly motivated students in the flipped-classroom condition exhibited the greatest gains in problem-solving skills, while less motivated learners showed more modest progress. This finding supports SDT, which emphasizes that the autonomy, competence, and relatedness dimensions inherent in flipped classrooms strengthen learners' motivation and engagement (Muir, 2021). The interplay between motivation and strategy thus fosters not only cognitive achievement but also affective and behavioral transformation, leading to more sustainable learning outcomes.

In parallel with the quantitative findings, qualitative observations reinforced the statistical results. During the intervention, observable improvements were noted in students' attitudes, participation, and interpersonal interactions. Students who were initially passive, hesitant, and dependent on teacher guidance began to demonstrate independence, initiative, and collaboration after the intervention. Those categorized as having "low" learning attitudes before the treatment advanced to "moderate," while many "moderate" students moved into the "good" category following exposure to the flipped-classroom model. Students showed greater courage in expressing opinions, greater honesty in communication, greater discipline in time management, and greater responsibility in completing group tasks. This behavioral shift reflects the internalization of life skills, particularly self-control, accountability, and adaptability, which are essential competencies for inclusive learners in the 21st century.

Similarly, assessments of student performance in terms of accuracy, responsibility, and teamwork also displayed marked improvement. Before the intervention, most students were rated in the "poor" to "moderate" range, but after exposure to the integrated learning model, their performance improved to the "moderate" and "good" levels. These findings confirm that video-based flipped learning not only enhances cognitive achievement but also strengthens affective and psychomotor dimensions of learning. The model's emphasis on student-centered interaction, peer collaboration, and active reflection fosters social and emotional competencies, which are particularly valuable for learners with disabilities who often face difficulties in self-regulation and communication (Hunaidah et al., 2018). The inclusive and multimodal nature of the learning process ensures that both typical and disabled students benefit from equal participation and accessible pathways to mastery.

Another key finding concerns the social dimension of learning in the flipped classroom. Integrating digital media with cooperative learning strategies created a dynamic, supportive environment that encouraged peer mentoring between typical and disabled students. These interactions fostered empathy, patience, and collaborative problem-solving, aligning with the core tenets of inclusive education that emphasize equity and social participation. The enhanced interactional quality observed in the experimental group suggests that the flipped approach contributes to social cohesion and shared responsibility that extend beyond academic learning

into the moral and civic domains of education. This transformation indicates that inclusive classrooms benefit significantly from pedagogical models that promote both technological engagement and human connection.

In addition, teachers' observational notes revealed an evolution in classroom culture. Initially, students showed low engagement and relied heavily on direct instruction. As the intervention progressed, there was a noticeable shift toward collaborative inquiry and mutual support. The visual and interactive nature of the video materials captured students' attention and reduced cognitive barriers, particularly for those with learning disabilities. The flipped model allowed teachers to act more as facilitators, guiding students through problem-solving tasks rather than merely delivering content. This shift in the teacher role mirrors findings from global research emphasizing that flipped classrooms encourage active learning, reflective thinking, and equitable participation across diverse learning contexts.

Hypothesis Testing

RQ1-H1. Effect of Learning Strategy

The effect of the learning strategy on students' life-skill problem-solving performance was examined by comparing students who participated in video-based learning integrated with the flipped classroom approach with those who received video-based learning without the flipped classroom component. The statistical results are presented through the main effect of learning strategy in the two-way ANOVA, followed by the corresponding hypothesis test (H1).

The first hypothesis examined whether the instructional strategy significantly influenced students' life-skill problem-solving performance. The results of the two-way ANOVA revealed a statistically significant main effect of learning strategy on students' post-test scores, $F(1, 64) = 18.72$, $p < .001$, partial $\eta^2 = .226$. Students in the experimental group ($M = 84.68$, SD = 5.72) achieved significantly higher scores than those in the control group ($M = 76.15$, SD = 6.41). Students who learned through video-based learning integrated with the flipped classroom approach would demonstrate significantly higher life-skill problem-solving performance than students who learned through video-based learning without the flipped classroom approach. These findings provide evidence for RQ1, indicating that the integration of video-based learning with the flipped classroom approach significantly improves students' life-skill problem-solving performance.

RQ2-H2. Effect of Learning Motivation

The effect of students' learning motivation on life-skill problem-solving performance was examined by comparing students with high and low levels of learning motivation. The statistical results are presented through the main effect of learning motivation in the two-way ANOVA, followed by the corresponding hypothesis test (H2).

The second hypothesis examined the main effect of learning motivation on students' life-skill problem-solving performance. The analysis showed a statistically significant effect of learning motivation, $F(1, 64) = 12.58$, $p = .001$, partial $\eta^2 = .164$. Students with high learning motivation ($M = 85.31$, SD = 5.36) performed significantly better than students with low learning

motivation (*M* = 75.84, SD = 6.82). Students with high learning motivation would demonstrate significantly higher life-skill problem-solving performance than students with low learning motivation. These findings provide evidence for RQ2, demonstrating that students with higher learning motivation achieve significantly better life-skill problem-solving performance than students with lower learning motivation.

RQ3-H3. Interaction Effect between Learning Strategy and Learning Motivation

The interaction between learning strategy and students' learning motivation was examined to determine whether the effectiveness of the learning strategy varied according to students' motivational levels. The interaction results are presented through the learning strategy × motivation term in the two-way ANOVA, supported by the corresponding interaction pattern and hypothesis test (H3).

The third hypothesis investigated whether learning motivation moderated the effect of instructional strategy on students' life-skill problem-solving performance. The results indicated a statistically significant interaction between learning strategy and learning motivation, $F(1, 64) = 5.91$, $p = .018$, partial $\eta^2 = .085$. As illustrated in Figure 1, students with high learning motivation benefited more from the video-based learning integrated with the flipped classroom approach than students with low learning motivation. There is a significant interaction effect between learning strategy and learning motivation on students' life-skill problem-solving performance. These findings provide evidence for RQ3, showing that the effectiveness of the video-based learning integrated with the flipped classroom approach depends on students' level of learning motivation.

DISCUSSION

The findings of this study confirmed that integrating video-based learning and flipped classroom pedagogy has a significant and positive influence on students' life-skill problem-solving abilities, as well as on their attitudes and performance in inclusive secondary school settings. These outcomes directly address the research objectives, validating the hypothesis that when students with and without disabilities are exposed to technology-enhanced, student-centered pedagogies, their cognitive, affective, and behavioral competencies develop in a more balanced and sustainable manner. The results not only demonstrate empirical consistency with prior research on digital and inclusive pedagogy but also extend theoretical understanding by situating these interactions within the specific cultural and educational context of inclusive schooling in Indonesia.

In particular, the evidence underscores that the combination of video-based learning and flipped classroom design represents an effective pedagogical innovation for addressing the diverse needs of learners in inclusive classrooms. By integrating digital media with constructivist learning principles, this model empowers students to engage actively with content both inside and outside the classroom, thereby transforming them from passive recipients of information into active constructors of knowledge (Hariyati et al., 2025). Within the flipped classroom

structure, students first encounter new materials through video instruction at their own pace and later apply this knowledge collaboratively during in-class problem-solving activities. This two-stage cycle promotes self-regulation, reflection, and application three essential dimensions of 21st-century life skills (Kellenberg et al., 2017). As the current findings show, these processes help students, especially those with disabilities, to build stronger confidence, independence, and persistence when dealing with complex real-world problems.

From a broader pedagogical perspective, the significance of these findings lies in demonstrating how motivation and learning strategy interact dynamically to influence educational outcomes. Motivation, in this context, is not a static variable but a mediating factor that amplifies the effectiveness of instructional design. Students who perceive the learning environment as supportive, relevant, and autonomy-enhancing are more likely to engage deeply, persist longer, and achieve higher levels of mastery (Maddens et al., 2023). This explains why learners with high motivation in this study demonstrated more pronounced gains in life-skill problem-solving than their less-motivated peers, even under the same instructional conditions. Hence, motivation serves as a psychological catalyst, transforming video-based and flipped learning from mere delivery tools into transformative learning experiences that foster inclusivity and self-determination.

Interpretation of the Findings

The findings demonstrate that integrating video-based learning with the flipped classroom significantly enhanced students' life-skill problem-solving performance compared with conventional video-based learning. This finding suggests that combining asynchronous video instruction with active in-class learning provides students with greater opportunities to construct conceptual understanding before engaging in collaborative problem-solving activities. The instructional approach also promotes deeper cognitive processing by shifting lower-order learning activities outside the classroom while maximizing higher-order thinking during face-to-face instruction. Consequently, students become more actively engaged in analyzing authentic problems, evaluating alternative solutions, and applying conceptual knowledge to real-life situations. This finding is consistent with Alfin et al. (2019), who demonstrated that collaborative science learning can strengthen students' collaborative problem-solving skills and self-confidence. In the present study, the collaborative activities embedded within the flipped classroom similarly provided opportunities for students to discuss problems, exchange solution strategies, and develop greater confidence in addressing real-life challenges.

The significant effect of learning motivation indicates that motivational readiness plays an important role in developing students' life-skill problem-solving abilities. Students with higher motivation demonstrated greater persistence, self-regulation, and willingness to engage in challenging learning tasks. These findings are consistent with SDT, which emphasizes that autonomy, competence, and relatedness foster intrinsic motivation and sustained academic engagement.

The significant interaction between instructional strategy and learning motivation indicates that the effectiveness of video-based learning integrated with the flipped classroom depends partly on students' motivational characteristics. Highly motivated students benefited more from the intervention because they were more likely to complete pre-class learning activities, actively participate in classroom discussions, and independently explore alternative solutions during collaborative problem-solving tasks.

The present findings are consistent with previous research demonstrating that flipped classroom instruction improves academic achievement, critical thinking, and learning engagement across various educational settings (Naing et al., 2023; Li et al., 2025). Similarly, studies by Lo and Hew (2021) reported that combining pre-class video learning with active classroom activities promotes deeper conceptual understanding and higher-order thinking. The current study extends these findings by demonstrating that the instructional benefits of the flipped classroom also apply to life-skill problem-solving within inclusive secondary education, a context that has received comparatively limited empirical attention.

The Role of Video-Based Learning and Flipped Classroom in Developing Life-Skill Problem-Solving

The findings of this study highlight that integrating video-based learning and flipped classroom pedagogy plays a crucial role in improving students' life-skills and problem-solving abilities in inclusive educational settings. The quantitative results indicated a statistically significant difference ($p = 0.000 < 0.05$), confirming that students who participated in video-based learning combined with flipped classroom showed superior problem-solving performance compared to those who experienced video-based learning without flipped instruction. This empirical evidence reinforces the argument that technologically mediated, learner-centered pedagogies are vital for fostering higher-order cognitive and metacognitive skills. The growing importance of technology-mediated learning is also reflected in physics education research, where online learning has emerged as a significant area of scholarly attention, particularly during the COVID-19 pandemic (Jatmiko et al., 2021). More broadly, the extensive body of highly cited research on digital and mobile learning further indicates the growing role of digital technologies in transforming educational practices and learning environments (Prahani et al., 2022). Such approaches enable both disabled and non-disabled learners to engage in active knowledge construction, reflective thinking, and collaborative exploration (Chukwudike Ugwoke et al., 2024).

From a theoretical perspective, this finding aligns with Sun et al. (2024), who explain that the Cognitive Theory of Multimedia Learning posits that information processing is more effective when both visual and auditory channels are simultaneously engaged. Video-based learning reduces extraneous cognitive load, providing learners with adequate time to process, integrate, and retain new information. Moreover, the dual-channel principle of multimedia learning allows students, especially those with cognitive or sensory disabilities, to visualize abstract concepts, making it easier to internalize procedural steps in problem-solving. As Yaşar (2025) explains, video-based instruction enhances learner autonomy by offering flexibility in

pacing and repetition, thereby strengthening retention and understanding. This aligns with the constructivist paradigm, which views learning as an active process of meaning-making, in which learners reconstruct their understanding through interaction with content and peers.

The flipped classroom model complements video-based learning by restructuring classroom dynamics to maximize interaction and practice. Rather than passively receiving information, students engage in active, higher-order tasks during class time, such as problem-solving discussions, peer feedback, and applied exercises, after independently reviewing video materials. This model grants learners more control over their learning pace and fosters deeper comprehension (Danker, 2015). The approach embodies constructivist learning principles, where meaning emerges through experience, collaboration, and reflection. Furthermore, flipped instruction has been shown to enhance students' creativity, self-efficacy, and communication skills (Indah Lestari et al., 2020). Recent research by Yu (2022) confirmed that flipped models increase academic performance and engagement among diverse learners by fostering ownership of learning and promoting inclusivity.

The Role of Motivation in Enhancing Life-Skill Problem-Solving

The findings of this study revealed that motivation plays a crucial and statistically significant role in enhancing students' life-skill problem-solving abilities, as evidenced by a probability value of 0.002 (< 0.05). This suggests that motivation is not a peripheral factor but rather a central determinant of learning success and adaptive performance in inclusive education contexts. In this study, students with higher motivation exhibited greater persistence, initiative, and enthusiasm when completing complex problem-solving tasks. These outcomes reinforce the notion that motivation contributes directly to cognitive engagement, emotional resilience, and behavioral regulation three essential dimensions of life-skill development. This finding resonates with prior evidence showing that motivation is a critical enabler of improved learning outcomes, especially in settings that require high levels of autonomy and self-regulation, such as video-based and flipped learning environments. Highly motivated learners in this study also demonstrated enhanced attention, goal-setting, and reflection, aligning with Collie and Martin (2019), who assert that motivation serves as the engine driving engagement, perseverance, and curiosity.

From a theoretical perspective, these findings are firmly grounded in SDT, which posits that human motivation is nurtured when three basic psychological needs autonomy, competence, and relatedness are fulfilled. Within the blended model of video-based and flipped classroom instruction, these needs were inherently satisfied: students were provided with autonomy through self-paced video learning, competence through structured in-class problem-solving, and relatedness through peer collaboration and teacher feedback. This multidimensional support created an optimal motivational climate that encouraged students to take ownership of their learning. In turn, this fostered intrinsic motivation, an internalized drive that sustains long-term engagement in learning even in the face of challenges. This result is consistent with the findings of Kácovský et al. (2023), who demonstrated that intrinsic

motivation significantly predicts effort regulation and self-efficacy in technology-enhanced classrooms. Similarly, Goddard and Evans (2018) emphasized that SDT-based learning designs foster deeper engagement and psychological well-being, both of which are essential in inclusive education, where students' confidence and self-esteem are often fragile.

Moreover, the Expectancy-Value Theory (EVT) developed by Eccles and Wigfield complements this framework by explaining how students' beliefs about their competence (expectancy) and the importance or utility of the task (value) interact to determine their motivation and effort investment. In this study, life-skill problem-solving activities were designed to mirror real-world contexts, making them personally meaningful and socially relevant for students. As a result, students perceived these tasks as valuable and attainable, thereby increasing their engagement and emotional commitment. The inclusion of authentic, contextualized problems allowed students to see the purpose of their learning, which magnified their persistence and focus, key outcomes predicted by EVT. Thus, both SDT and EVT jointly explain why motivated learners were more effective at integrating cognitive, emotional, and behavioral strategies to master complex life skills.

In inclusive learning settings, sustaining motivation becomes even more vital due to the unique cognitive, emotional, and social challenges faced by students with disabilities. These learners often experience lower self-efficacy and higher anxiety, which can undermine persistence in problem-solving tasks. The video-based flipped classroom model employed in this study addresses these barriers by structuring learning into manageable phases that enhance both autonomy and competence. The asynchronous video learning phase enables learners to review and control the pace of their learning, thus reducing cognitive load and performance pressure. Meanwhile, the synchronous in-class phase fosters competence through active discussion, collaborative problem-solving, and teacher scaffolding. These structured, multimodal experiences satisfy learners' psychological needs, thereby enhancing both intrinsic and extrinsic motivation. The integration of motivational design principles such as visual reinforcement, immediate feedback, and goal orientation further sustains students' interest and perseverance in learning.

Interaction of Video-Based Learning, Flipped Classroom, and Motivation

The interaction pattern in Figure 1 shows that the sharpest increase in problem-solving scores occurred in highly motivated students when participating in a video-based flipped classroom, indicating that motivation acts as a moderator, strengthening the influence of learning strategies. Pedagogically, the flipped classroom provides a structure that allows students to utilize videos for independent study before class and optimizes face-to-face time for meaningful activities such as collaboration, discussion, practice, and feedback. However, this structure requires psychological encouragement for active and consistent student engagement, so highly motivated students are more likely to translate these learning opportunities into significant performance improvements. Conversely, students with low motivation exhibited a nearly flat line even in the flipped environment, suggesting that motivational limitations can hinder

engagement, persistence, and transfer of learning to problem-solving contexts. These findings align with SDT, which emphasizes that motivation increases when basic psychological needs are met: autonomy, competence, and relatedness. In flipped learning, autonomy is reflected through the flexibility of asynchronous videos that can be repeated as needed, competence is reinforced through practice and feedback during class, and relatedness is formed through collaboration and social interaction among students. Therefore, flipped classrooms are most effective when students have sufficient motivation to utilize these affordances, while for students with low motivation, additional strategies are needed such as self-regulation scaffolding, reinforcement of learning goals, social support, and more structured task design so that the impact of flipped learning can be more evenly distributed, especially in the context of inclusive education, which has diverse learning needs and readiness.

The interaction between learning strategy and motivation thus transcends academic performance and extends into character and social development. The reciprocal peer-learning processes within the flipped classroom fostered empathy and collaboration among disabled and typical learners, embodying the moral foundation of inclusive education. This inclusive and interactive structure resonates with the aims of the Sustainable Development Goals (SDG 4), which advocate for equitable, quality education and lifelong learning opportunities for all (Alhusni et al., 2025). Therefore, the synergy among video-based instruction, flipped pedagogy, and motivation can be conceptualized as a triadic model of inclusive excellence that integrates technological accessibility, pedagogical adaptability, and psychological empowerment. This study thus contributes a novel empirical foundation for rethinking inclusive education in the digital era, where teaching innovation must not only deliver knowledge but also inspire self-determination, agency, and social-emotional growth.

Implications for Inclusive Education and Theory Development

The findings of this study have strong implications for both inclusive education and theoretical advancement. Theoretically, they affirm that integrating video-based learning, flipped classroom pedagogy, and motivation forms a coherent framework for developing life-skill problem-solving within inclusive contexts. This synergy among technology, pedagogy, and psychology demonstrates that digital approaches can serve as educational equalizers, supporting autonomy, mastery, and engagement for all learners, regardless of ability differences. The study also extends the Technology Pedagogy Motivation Alignment (TPMA) framework by emphasizing that motivational support is not an accessory but a structural component necessary for sustaining engagement and deeper learning (Gu et al., 2011).

Practically, these results highlight the importance of designing accessible and emotionally engaging learning environments in inclusive schools. Teachers should use video materials that follow universal learning design (UDL) principles, incorporating captions, visual cues, and relatable contexts to enhance comprehension for students with disabilities. Flipped classrooms further transform teachers into facilitators who can provide individualized feedback and encourage active collaboration. This structure fulfills the psychological needs of autonomy,

competence, and relatedness identified in SDT (Goddard & Evans, 2018), thus strengthening both cognitive and emotional outcomes.

The novelty of this study lies in its explicit integration of video-based learning, flipped classroom pedagogy, and learning motivation within a single quasi-experimental framework for inclusive secondary education. Unlike previous studies that have predominantly examined video-based learning, flipped classroom instruction, or learning motivation as separate factors, this study examines their combined and interactive effects on students' life-skill problem-solving performance, including learners with and without disabilities. More specifically, the study demonstrates that the effectiveness of the video-based flipped classroom is not uniform across learners but is significantly associated with their level of learning motivation. This interaction provides new empirical evidence that the effectiveness of technology-enhanced and student-centered instruction in inclusive classrooms depends not only on the instructional strategy itself but also on students' motivational readiness. Thus, the principal novelty of this study is the development of an integrated empirical perspective that connects instructional technology, flipped pedagogy, and motivational factors to life-skill problem-solving in an inclusive secondary school context, which has received comparatively limited empirical attention.

Despite its contributions, this study has several limitations that provide opportunities for future research. First, the relatively small sample size may limit the generalizability of the findings. Second, the study was conducted in inclusive secondary schools within a single geographical region; therefore, future studies should include larger, more diverse samples across different educational contexts. Third, future research may investigate additional variables, such as self-efficacy, digital literacy, collaborative skills, and cognitive load, to better understand the mechanisms underlying students' development of life-skill problem-solving. Longitudinal and mixed-methods studies are also recommended to examine the long-term sustainability of the instructional intervention.

CONCLUSION

Based on the findings and discussion, this study concludes that integrating video-based learning and flipped classroom pedagogy effectively enhances life-skill problem-solving among both disabled and typical students in inclusive schools. The results further confirm that motivation plays a critical mediating role in improving these life skills, functioning as a psychological driver that strengthens students' persistence, self-regulation, and engagement. The interaction between learning strategy and motivation was statistically significant, demonstrating that pedagogical innovation and motivational readiness work synergistically to promote deeper understanding, reflective learning, and behavioral transformation. Beyond cognitive improvement, this study revealed significant growth in students' attitudes and performance, including courage, honesty, discipline, accuracy, and teamwork. These findings indicate that the combined use of video-based learning and flipped classroom creates an interactive, engaging,

and inclusive learning environment that accommodates the diverse needs of both disabled and typical learners.

Acknowledgements

The authors would like to thank the Special Education Study Program, Faculty of Education, Universitas Negeri Surabaya, for their support and contribution to this study.

REFERENCES

Alhusni, H. Z., Ramadani, R., Sunarti, T., Madlazim, M., & Ahmadi, M. R. D. (2025). Bibliometric Analysis of Earth Science Physics Learning in Higher Education: Challenges, Innovations, and Contributions to Education for Sustainable Development. *Journal of Law and Bibliometrics Studies*, *1*(2), 87. https://doi.org/10.63230/jolabis.1.2.87

Alfin, J., Fuad, A. Z., Nur, M., Yuanita, L., & Prahani, B. K. (2019). Development of group science learning (GSL) model to improve the skills of collaborative problem solving, science process, and self-confidence of primary schools teacher candidates. *International Journal of Instruction, 12*(1), 147-164. https://doi.org/10.29333/iji.2019.12110a

Anas M, M., Irawati, M., Rahayu, S., & Murti, W. (2025). Integrating Anging Mammiri Cultural Values into Learning to Improve Students' Problem-Solving Skills. *Journal of Culture and Values in Education, 8*(3), 203-236. https://doi.org/10.46303/jcve.2025.33

Arrahmat, M. W., Anggaryani, M., Saputra, O., & Hulu, N. M. (2025). Bibliometric Study: Trends of Development Digital Media to Improve 21st Century Students' Skills in Physics Learning. *Journal of Law and Bibliometrics Studies*, *1*(2), 89. https://doi.org/10.63230/jolabis.1.2.89

Arrasyid, F. I. (2023). Portraying Teachers' Strategies To Teach English In The Learning-From-Home Model. *Wiralodra English Journal*, *7*(2), 123–136. https://doi.org/10.31943/wej.v7i2.238

Arsyad, M., Khan, R., & Sothy, C. (2025). The use Problem Based Learning Methods in Science Education. *Journal Neosantara Hybrid Learning*, *2*(3), 495–504. https://doi.org/10.70177/jnhl.v2i3.2072

Chang, C., Hwang, G., & Ou, L. (2025). Fostering the Life Skills of Learners With Intellectual Disabilities Using Interactive Technologies: A Motivational Model-Based Digital Game-Based Training Approach. *Journal of Computer Assisted Learning*, *41*(2). https://doi.org/10.1111/jcal.70026

Chen, M. A., Hwang, G., & Chang, Y. (2019). A reflective thinking-promoting approach to enhancing graduate students' flipped learning engagement, participation behaviors, reflective thinking and project learning outcomes. *British Journal of Educational Technology*, *50*(5), 2288–2307. https://doi.org/10.1111/bjet.12823

Chukwudike Ugwoke, K., Sunday Bwankhot, E., & Sulaiman, Z. (2024). Empowering Learning: The Numbered Heads Together Strategy for Inclusive Science Education. *Journal of Humanities and Social Sciences Research*, *6*(2), 1–8. https://doi.org/10.37534/bp.jhssr.2024.v6.n2.id1270.p1

Collie, R. J., & Martin, A. J. (2019). Motivation and Engagement in Learning. In *Oxford Research Encyclopedia of Education*. Oxford University Press. https://doi.org/10.1093/acrefore/9780190264093.013.891

Danker, B. (2015). Using Flipped Classroom Approach to Explore Deep Learning in Large Classrooms. *IAFOR Journal of Education*, *3*(1). https://doi.org/10.22492/ije.3.1.10

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Diahyleva, O., Yurzhenko, A., & Kononova, O. (2023). Design of flipped classroom lesson in educational electronic environment of maritime higher education institutions. *Scientific Bulletin of Mukachevo State University Series "Pedagogy and Psychology,"9*(3), 45–53. https://doi.org/10.52534/msu-pp3.2023.45

Eccles, J. S., & Wigfield, A. (2020). From expectancy-value theory to situated expectancy-value theory: A developmental, social cognitive, and sociocultural perspective on motivation. *Contemporary Educational Psychology*, *61*, 101859. https://doi.org/10.1016/j.cedpsych.2020.101859

Edwin, E., Widiana, I. W., Lasmawan, I. W., & Suharta, I. G. P. (2025). Curriculum Transformation Towards Future Education. *Prima Magistra: Jurnal Ilmiah Kependidikan*, *6*(2), 122–132. https://doi.org/10.37478/jpm.v6i2.4907

Goddard, C., & Evans, D. (2018). Primary Pre-Service Teachers' Attitudes Towards Inclusion Across the Training Years. *Australian Journal of Teacher Education*, *43*(6), 122–142. https://doi.org/10.14221/ajte.2018v43n6.8

Gu, X., Solmon, M. A., Zhang, T., & Xiang, P. (2011). Group Cohesion, Achievement Motivation, and Motivational Outcomes among Female College Students. *Journal of Applied Sport Psychology*, *23*(2), 175–188. https://doi.org/10.1080/10413200.2010.548847

Hariyati, M., Nursalim, M., Fitri, R., Heriyanto, & Destrianto, M. R. (2025). Applying Constructivism Principles to Enhance Digital Media Literacy in Higher Education. *Khizanah Al-Hikmah : Jurnal Ilmu Perpustakaan, Informasi, Dan Kearsipan*, *13*(1), 86–100. https://doi.org/10.24252/v13i1a7

Hu, Y., & Shu, J. (2025). The Effect of Drama Education on Enhancing Critical Thinking Through Collaboration and Communication. *Education Sciences*, *15*(5), 565. https://doi.org/10.3390/educsci15050565

Huang, H.-W., & Chang, T.-S. (2024). Integrating ChatGPT in Flipped Hospitality and Tourism Education Course Design: A Self-determination Theory Perspective. *Proceedings of the 2024 8th International Conference on Digital Technology in Education (ICDTE)*, 102–107. https://doi.org/10.1145/3696230.3696237

Hunaidah, Susantini, E., Wasis, Prahani, B. K., & Mahdiannur, M. A. (2018). Improving Collaborative Critical Thinking Skills of Physics Education Students through Implementation of CinQASE Learning Model. *Journal of Physics: Conference Series*, *1108*, 012101. https://doi.org/10.1088/1742-6596/1108/1/012101

Indah Lestari, D., Haris Effendi-Hasibuan, M., & Muhammad, D. (2020). The effect of the flipped classroom approach and self-efficacy on a guided inquiry on students' creative thinking skills. *Jurnal Pendidikan Kimia*, *12*(2), 95–105. https://doi.org/10.24114/jpkim.v12i2.19435

Jatmiko, B., Prahani, B. K., Suprapto, N., Admoko, S., Deta, U. A., Lestari, N. A., Jauhariyah, M. N., Yantidewi, M., & Muliyati, D. (2021). Bibliometric analysis on online physics learning during COVID-19 pandemic: Contribution to physics education undergraduate program. *Journal of Physics: Conference Series, 2110*(1), 012018. https://doi.org/10.1088/1742-6596/2110/1/012018

Kácovský, P., Snětinová, M., Chvál, M., Houfková, J., & Koupilová, Z. (2023). Predictors of students' intrinsic motivation during practical work in physics. *International Journal of Science Education*, *45*(10), 806–826. https://doi.org/10.1080/09500693.2023.2175626

Kantathanawat, T., Treearpornwong, A., & Charoentham, M. (2025). Development of a problem-solving ability learning model for children with intellectual disabilities. *Journal of Education and Health Promotion*, *14*(1). https://doi.org/10.4103/jehp.jehp_13_25

Kanthimathi, S., & Raja, B. W. D. (2025). Transforming Education: From Rote Learning To Critical Thinking In Modern Classrooms. *EPH-International Journal of Educational Research*. https://doi.org/10.53555/ephijer.v9i1.150

Kellenberg, F., Schmidt, J., & Werner, C. (2017). The Adult Learner: Self-Determined, Self-Regulated, and Reflective. *Journal of Pedagogy and Psychology "Signum Temporis,"9*(1), 23–29. https://doi.org/10.1515/sigtem-2017-0001

Krishnan, P. (2021). When and how to use factorial design in nursing research. *Nurse Researcher*, *29*(1), 26–31. https://doi.org/10.7748/nr.2020.e1757

Li, Y., Zhang, X., Wang, H., & Chen, L. (2025). The effectiveness of the flipped classroom: A second-order meta-analysis. *Computers & Education, 230*, 105442. https://doi.org/10.1016/j.compedu.2025.105442

Maddens, L., Depaepe, F., Raes, A., & Elen, J. (2023). Fostering students' motivation towards learning research skills: the role of autonomy, competence and relatedness support. *Instructional Science*, *51*(1), 165–199. https://doi.org/10.1007/s11251-022-09606-4

Maqsood, F., Malik, Prof. Dr. S., & Jumani, Prof. Dr. N. B. (2022). Role of Life Skills Education in Empowering Secondary School Students: An Explanatory Study. *International Research Journal of Education and Innovation*, *3*(1), 200–213. https://doi.org/10.53575/irjei.v3.01.19(22)200-213

Maulana, R., Helms-Lorenz, M., Irnidayanti, Y., & van de Grift, W. (2016). Autonomous Motivation in the Indonesian Classroom: Relationship with Teacher Support Through the Lens of Self-Determination Theory. *The Asia-Pacific Education Researcher*, *25*(3), 441–451. https://doi.org/10.1007/s40299-016-0282-5

Mayer, R. E. (2021). Evidence-based principles for how to design effective instructional videos. *Journal of Applied Research in Memory and Cognition*, *10*(2), 229–240. https://doi.org/10.1016/j.jarmac.2021.03.007

Mokhampanyane, M. (2024). Teachers' Capabilities in Implementing Inclusive Education: A South African Perspective. *Research in Social Sciences and Technology, 9*(3), 11-25. https://doi.org/10.46303/ressat.2024.44

Muhuro, P., & Kang'ethe, S. (2025). Prospects of Implementing the Flipped Classroom Blended Learning Model among Lecturers in African Universities. *Research in Social Sciences and Technology, 10*(1), 144-158. https://doi.org/10.46303/ressat.2025.8

Muir, T. (2021). Self-determination theory and the flipped classroom: a case study of a senior secondary mathematics class. *Mathematics Education Research Journal*, *33*(3), 569–587. https://doi.org/10.1007/s13394-020-00320-3

Naing, C., Whittaker, M. A., Toh, L. S., Campbell, A. V., & Mak, J. W. (2023). The effects of flipped classrooms to improve learning outcomes in undergraduate health professional education: A systematic review. *Campbell Systematic Reviews, 19*(3), e1339. https://doi.org/10.1002/cl2.1339

Prahani, B. K., Amiruddin, M. Z., Jatmiko, B., Suprapto, N., & Amelia, T. (2022). Top 100 cited publications for the last thirty years in digital learning and mobile learning. *International Journal of Interactive Mobile Technologies (iJIM), 16*(08), 18-33. https://doi.org/10.3991/ijim.v16i08.29803

Prahani, B. K., Rizki, I. A., Nisa', K., Citra, N. F., Alhusni, H. Z., & Wibowo, F. C. (2022). Implementation of online problem-based learning assisted by digital book with 3D animations to improve student's physics problem-solving skills in magnetic field subject. *Journal of Technology and Science Education*, *12*(2), 379. https://doi.org/10.3926/jotse.1590

Qehaja, A. B. & Kida, E.B. (2025). Enhancing Life Satisfaction Through Problem-Solving: The Mediating Impact of Financial Strain and Moderating Roles of Economic Hope and Education. *Journal of Social Studies Education Research, 16*(3), 33-68. https://jsser.org/index.php/jsser/article/view/6459/742

Qotrunnada, N. A. (2022). Analysis of the Difficulties of High School Students in Improving Problem Solving Ability in Physics Learning. *International Journal of Current Educational Research*, *1*(1), 84–101. https://doi.org/10.53621/ijocer.v1i1.141

Rahayu, M. N., Mariono, A., & D., S. W. (2025). Flipped Classroom Model Combined with Problem-Based Learning: Increase Thinking Ability. *Akademika*, *13*(02), 157–167. https://doi.org/10.34005/ak.v13i02.4300

Rahmatullah, P. I., Akhyar, M., & Efendi, A. (2025). Enhancing High School Students' Problem-Solving Skills Through Digital Module Integration. *JTP - Jurnal Teknologi Pendidikan*, *27*(1), 245–259. https://doi.org/10.21009/jtp.v27i1.53496

Rahmawati, F., Nizaruddin, N., & Murtianto, Y. H. (2025). Students' Boredom Profile in Mathematical Problem-Solving: A Computational Thinking Perspective. *Jurnal Pendidikan MIPA*, *26*(1), 131–152. https://doi.org/10.23960/jpmipa.v26i1.pp131-152

Sasanti, R. D. (2025). Improving Problem Solving Skills using the Collaborative Problem Solving Model. *Advances in Nonlinear Variational Inequalities*, *28*(7s), 88–100. https://doi.org/10.52783/anvi.v28.4486

Rohmah, N. L., Jatmiko, B., & Wijaksono, C. F. (2025). Application of STEAM Learning to Enhance Students' Critical Thinking Skills. *Journal of Current Studies in SDGs*, *1*(3), 77. https://doi.org/10.63230/jocsis.1.3.77

Romadhon, D. R., Muslim, M. A. B., & Suwarna, I. P. (2024). Video-Based Laboratories in Physics: A Quasi-Experimental Study on Rotational Dynamics and Critical Thinking Enhancement. *Jurnal Pijar Mipa*, *19*(4), 732–737. https://doi.org/10.29303/jpm.v19i4.7266

Sharma, A., & Ghosh, Dr. S. (2023). Inclusive Education: Strategies for Fostering Positive Classroom Environment for Students with Disabilities. *International Journal of Research Publication and Reviews*, *4*(12), 1291–1299. https://doi.org/10.55248/gengpi.4.1223.123412

Soetra, V. F., Dwikoranto, D., & Bergsma, L. N. (2025). Implementation of STEAM-Based Project-Based Learning to Improve Critical Thinking Skills to Support SDG 4. *Journal of Current Studies in SDGs*, *1*(3), 80. https://doi.org/10.63230/jocsis.1.3.80

Sun, Y., Wu, W., Zhu, K., Huang, H., Guo, J., & Li, Y. (2024). *The effect of visual and auditory channel interaction on cognitive performance in online education*. https://doi.org/10.54941/ahfe1004508

Sunarti, T., Wasis, Madlazim, Suyidno, & Prahani, B. K. (2018). The effectiveness of CPI model to improve positive attitude toward science (PATS) for pre-service physics teacher. *Journal of Physics: Conference Series*, *997*, 012013. https://doi.org/10.1088/1742-6596/997/1/012013

Tomar, S., Arundhathi, A., Gupta, S., & Sharma, M. (2024). Digital assessment: impact on student motivation, peer learning, group dynamics. *Journal of Education and Learning (EduLearn)*, *18*(1), 9–17. https://doi.org/10.11591/edulearn.v18i1.21138

Ubabuddin. (2020). A Study Review Of Active Learning Strategy In Improving Students' Learning Motivation. *IJGIE (International Journal of Graduate of Islamic Education)*, *1*(1), 8–15. https://doi.org/10.37567/ijgie.v1i1.19

UNESCO. (2016). *Education 2030: Incheon Declaration and Framework for Action—Towards inclusive and equitable quality education and lifelong learning for all*. Https://Unesdoc.Unesco.Org/Ark:/48223/Pf0000245656.

UNESCO. (2017). *A Guide for ensuring inclusion and equity in education*. UNESCO. https://doi.org/10.54675/MHHZ2237

Yaşar, M. Ö. (2025). Developing Self-Regulated Learning in ELT Through a Video-Based Pedagogical Framework (VIDPEF): A Conceptual Model for EFL Learners. *Studies in Self-Access Learning Journal*, *16*(1), 76–99. https://doi.org/10.37237/160105

Yu, E. (2022). The Effectiveness of Flipped Learning Model on Korean Language Learning as a Foreign Language: Speaking Class in a University Level. *Shanlax International Journal of Education*, *11*(S1-Dec), 1–10. https://doi.org/10.34293/education.v11iS1-Dec.4966