

The Interplay of Instructional Styles, Academic Motivation, and Engagement in an English Language Flipped Classroom Context

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Abstract

This study was aimed at uncovering connections between instructional styles, academic motivation, and academic engagement of Grade 12 high school students in the context of a flipped English language classroom in Cambodia. A correlational design involving a cross-sectional survey was conducted with 510 students recruited from one public high school in Cambodia. The data collection tool included a structured questionnaire, and Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to analyse the collected data. Both the measurement and structural models were analysed simultaneously, while the mediation effects were identified through the application of a bootstrapping technique with 5,000 resamples. The results of the analysis have shown that the measurement model possessed satisfactory levels of reliability and validity, which made it possible to use it in the present study. The structural model showed that support for academic autonomy was the most powerful predictor of academic motivation and academic engagement. Moreover, intrinsic motivation mediated the relationship between instructional styles and students' affective, behavioural, and cognitive engagement in learning, whereas extrinsic motivation had no mediating effect. Among the instructional dimensions, support for academic autonomy and support for video lectures resulted in the greatest indirect influence on engagement through intrinsic motivation. This means that creating an autonomy-supportive and properly organized technology-based environment can help in fostering intrinsic motivation. Thus, English language teachers need to focus on such aspects as learner autonomy, constructive feedback, and effective video lessons in order to promote students' competence, autonomy, and relatedness and consequently increase their engagement in learning the English language.

Keywords: instructional styles, academic motivation, student engagement, flipped classroom, english language learning.

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1. Introduction

The globalized world has heightened the significance of English proficiency. Enhancing the effectiveness of English language teaching (ELT) is a central concern for educators and policymakers worldwide. Notably, student-centered approaches linked to technological approaches are increasingly a concern, supplementing or replacing the traditional approach. Among these approaches, the flipped classroom model has garnered significant attention among innovation-supportive instructors (Han & Klein, 2019; Ho et al., 2021; Liu et al., 2024). This instructional model reversed the typical lecture and learning task, delivering mostly instructional content through video lectures outside of the class while using in-person time for interactive and cooperative activities (Bergmann & Sams, 2012; Ho et al., 2021).

Although the flipped classroom model revealed its potential effectiveness, its success remains uncertain. Providing video lectures through various contexts obliquely improves learning outcomes (Han & Klein, 2019; Liu et al., 2024). The effectiveness of this model depends on how the instructional styles that connect with technological and interpersonal methods are designed and implemented. However, late-career teachers in public schools in Cambodia encounter many difficulties in using it (Pang et al., 2022; Pen & Morrell, 2024). This study highlights the critical contribution of instructional styles, which encompass the interaction and support structures provided by instructors.

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Simultaneously, educational psychology underscores the significant internal experiences of students through their academic motivation and engagement. The acceleration of these experiences is the ultimate determinant of academic success (Ryan & Deci, 2020).

The rapid expansion of fundamental education, which is particularly relevant, characterizes the increasing integration of technology and its dynamics in the Cambodian educational context (Hul, 2022; Richardson, 2008). However, a significant gap exists in the literature regarding the specific mechanisms through English language teaching (Pang et al., 2022). The influence of the flipped classroom contributes to the complex nature of academic engagement, which is shaped by various instructional styles in a technology-enhanced classroom climate. It is unclear whether the support provided by the instructor directly contributes to student engagement or if it stems from a form of academic motivation that may enhance students' internal experiences.

2. Literature review

2.1. Theoretical foundations of self-determination theory

This study is based on self-determination theory, a widely utilized human motivation theory in educational contexts. The fulfilment of students' fundamental needs for competence, relatedness, and autonomy is essential for their optimal functioning, growth, and well-being (Eccles & Wigfield, 2002; Ryan & Deci, 2017). Competence refers to how students perceive their effectiveness in their educational experiences; relatedness refers to a sense of connection and belonging with others; and autonomy relates to how students understand their ability to make choices and start their action (Deci & Ryan, 2000). Theorists assert that social contextual factors, such as English instructional styles, may fulfil these needs, thereby promoting more autonomous forms of motivation (Niemiec & Ryan, 2009; Wang et al., 2019). This is expected to lead to more positive results, including increased participation and better quality in English language learning.

2.2. Instructional styles through English education

Instructional style refers to a teacher's preferred methods of teaching and learning developed over time (e.g., Chan et al., 2023; Ruos et al., 2025). English instructional styles seriously focus on how teachers of English utilize a student-centered approach integrated with technological material, such as video lectures (Ahmadi, 2018). This study concentrates on three English instructional styles associated with a flipped classroom, as suggested by the self-determination theory, to improve the internal experience of high school students in Cambodia. First, support for video lectures represents a specific instructional method in a flipped classroom. It focuses on the effectiveness, usefulness, and usability of pre-class video materials (Brame, 2016). Well-produced videos that are easy to learn from and directly related to in-class activities can enhance students' sense of competence by making the material more understandable and accessible (Ruos et al., 2025). Second, support and feedback styles involve the teacher providing beneficial guidance, praise for exceptional work, and constructive feedback regarding performance (Heng, 2014a). This approach addresses the need for competence by clarifying expectations and aiding students in their improvement. It also fulfills the need for relatedness through care and attention (Hattie & Timperley, 2007). Third, support for academic autonomy styles involves teachers prioritizing their students' perspectives by listening to them, offering learning choices, and encouraging them to take the lead. This reduces learning pressure, which enhances self-value and recognition of their contributions. This style is essential for fulfilling the need for autonomy, which is a key factor in intrinsic motivation (Reeve, 2006). Examples include allowing students to select their topics or project formats and encouraging them to pose questions. In summary, three types of English instructional styles promote learners' internal experiences, such as academic motivation and engagement, by investing in their autonomy, competence, and relatedness, thereby enhancing their English academic outcomes (Pentón Herrera et al., 2022).

2.3. Academic motivation in English language teaching

According to self-determination theory, academic motivation is not a singular concept. Humans' needs require both external and internal investment through their psychological states (Deci & Ryan, 1985). As the theory proposes, academic motivation is categorized into two types; extrinsic motivation refers to how students' concentration is enhanced by investing in their emotional states for their academic achievement, such as obtaining high grades, surpassing competitors, or obtaining validation (Ryan & Deci, 2020). When participating in English learning, students often have more pragmatic purposes for their studies (Akteruzzaman et al., 2024). On the contrary, intrinsic motivation refers to how a student's desire is accelerated through their deep self-esteem (Ryan & Deci, 2020). Participating in English instruction fosters a deeper sense of self-recognition, as students derive enjoyment and fulfilment from their activities, such as exploring curiosity, facing challenges, and achieving mastery in learning (Akteruzzaman et al., 2024).

As self-determination theory states, intrinsic motivation is associated with a deep learning approach, creativity, and self-perseverance, while extrinsic motivation is associated with a surface learning approach, thereby diminishing a human's persistence due to external pressure alleviation (Ryan & Deci, 2020).

2.4. Academic Engagement in English language learning

Engagement is a fundamental meta-construct that reflects the quality of a student's association with the educational process. In terms of academic engagement in English language learning, this focus on how students engage through English is not only about their personal behaviors but also more cognitive and emotional in their engagement (Amerstorfer & Freiin von Münster-Kistner, 2021). Depending on Gunuc and Kuzu (2015), academic engagement can be categorized into three types: affective engagement, which includes emotional aspects such as interest, enjoyment, happiness, and a sense of belonging in the classroom; behavioural engagement, which involves observable actions like participation, effort, persistence, and adherence to classroom discipline; and cognitive engagement, which pertains to psychological investment, including self-regulation, the use of deep learning strategies, and the desire to master more complex concepts.

2.5. The rationale and research purpose in English language teaching

Prior research provided a foundation for the proposed model. Previous studies have predicted that an autonomy-supportive instructional style is associated with higher intrinsic motivation (e.g., Niemiec & Ryan, 2009; Patall et al., 2018; Patall & Zambrano, 2019; Reeve & Cheon, 2021) and that positive teacher feedback correlates with perceived student competence (Ntoumanis, 2001). Furthermore, research has independently associated both intrinsic motivation and supportive instructional styles with a higher degree of academic engagement (Jang et al., 2012). But little is known about how they integrate all these constructs within a single model. Essentially, this integration takes place within the context of a flipped English language classroom. It is hypothesized that instructional styles do not merely directly influence engagement but primarily do so by creating a need-supportive environment that cultivates intrinsic motivation, which then drives active engagement. Therefore, the mediating analysis of academic motivations reveals distinct effects between intrinsic and extrinsic motivation, which forms the foundation of this investigation.

To address this gap, this study investigated the relationship between English instructional styles (i.e., support and feedback styles, support for academic autonomy, and support for video lectures), two significant forms of academic motivation (i.e., extrinsic and intrinsic motivation), and three components of academic engagement (i.e., affective, behavioural, and cognitive engagement). These allow for testing a comprehensive model by employing a robust quantitative methodology, thereby providing empirical evidence regarding these complex interrelationships. Moreover, this finding provides a significant theoretical contribution to how self-determination theory, within a novel context, is involved among Cambodian high school students. By validating this model, it provides practical implications for teachers, curriculum designers, and educational institutions seeking to maximize the potential of flipped classrooms in English language teaching. The research questions guiding this study are the following:

- a. To what extent do English instructional styles directly influence the academic engagement of high school students in English classes?
- b. To what extent do instructional styles influence the academic motivation of high school students in English classes?
- c. Does academic motivation mediate the relationship between instructional styles and academic engagement?

3. Methods

This study employed a correlational study within a quantitative research design through a cross-sectional survey. This study investigated the relationship between English instructional styles, academic motivation and engagement, and a simultaneous mediating study. There were 510 12th-grade students from a high school in Kampong Cham province of Cambodia whose ages ranged from 16 to 20 ($M = 17.5$; $SD = 1.60$). Specifically, most of the students were from pure science (61%) and were female (60%) rather than from social science and male students. The participants were experiencing a flipped classroom approach in their English language studies, where video lectures were used for pre-class learning.

3.1. Research instrument

The instrument was translated into Khmer and subjected to back-translation by Behling and Law (2000) and pilot testing to ensure clarity, validity, and cultural relevance. The research data were collected by a structured self-report questionnaire. The research instrument was created by identifying previously validated scales that were appropriate for

the specific context of our study. All indicators were evaluated using a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

English instructional styles were adapted from Heng (2014b) and Ruos et al. (2025). Support for video lecture measures the students' perception about the effectiveness of pre-class video-based learning and its integration with in-class activities within flipped classroom climates (e.g., "The lesson was well-explained in the videos," 7 items; $\alpha = 0.78$); support and feedback styles measure students' perception about their teachers' supportive behaviors and feedback practice by offering help, praise, regular monitoring, and constructive feedback (e.g., "My teacher always gives feedback that helped to improve my understanding"). 7 items, $\alpha = 0.80$). Support for academic autonomy measures students' perceptions about English language learning by providing choices, empathizing, building confidence, and encouraging learners' autonomy via promoting self-directed learning (e.g., my English teacher conveys confidence in my ability to do well in my English subject). 7 items, $\alpha = 0.79$).

Academic motivations adapted from Pintrich et al. (1993). Extrinsic motivation measures how students' perceptions are motivated by grades, competition, and external validation rather than internal interest (e.g., "The most important thing for me is improving my grade or points, of course"). 5 items, $\alpha = 0.79$) and the intrinsic motivation measure student's perceptions of how student motivations are motivated by curiosity, challenge, and the desire to learn rather than by grade or competition (e.g., I prefer homework that arouses my curiosity, even if it is difficult to solve. 6 items, $\alpha = 0.75$).

Academic engagement adapted from Chan et al. (2023). Affective engagement measures how much students' perceptions about their learning enjoyment and feeling excited are emotionally connected to their English class (e.g., I feel excited by my work in English class). 5 items, $\alpha = 0.84$); behavioral engagement measures the student's perceptions about how consistently students behave in the ways that support learning, such as following classroom rules, paying attention, and completing work (e.g., I pay attention in English class. 5 items, $\alpha = 0.68$); and the cognitive engagement measure students' perception about how actively and strategically students think about their learning and monitor their understanding and use resources to improve English language learning (e.g., I always check my English exercise for mistakes. 5 items, $\alpha = 0.81$).

3.2. Data collection

The appropriate institutional authorities gave their permission for the study. The school principals also contributed their permission. Participants and their parents or guardians were told what the study was about, that participation was optional, and that their answers would be kept private. A trained research assistant gave out the questionnaires in person during a regular class session, which made sure that a lot of students answered. They quickly gathered the filled-out questionnaires.

3.3. Data analysis

The research analysis was conducted with Smart PLS 3.2.9 software, evaluating Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM is more appropriate for this study because it aligns with the designed model, which incorporates mediators and aims to develop theory (Hair, Black et al., 2019). The analysis used a bifurcated method by evaluating the measurement and structural model simultaneously.

The measurement model entailed assessing the reliability and validity of the construct model by verifying internal consistency reliability using Cronbach's Alpha (α) and Composite Reliability (CR) values exceeding 0.70, which are deemed acceptable (Novick & Lewis, 1967). Not only to ensure each item converges in each construct, but convergent validity is evaluated via outer loadings (λ) and average variance extracted (AVE), such that loadings must exceed 0.7, and the average variance extracted (AVE) should surpass 0.50, while ensuring each construct is discriminated from other constructs (J. Hair et al., 2017). Discriminant validity is assessed using the Fornell and Larcker (1981) criterion, which states that the square root of the AVE must be greater than its correlation with any other construct, as well as the Heterotrait-Monotrait ratio (HTMT), which should remain below 0.90 (Henseler et al., 2015).

Evaluation of the structural model entailed examining the proposed relationships and mediating effects. This encompassed assessing the collinearity that employs the variance inflation factor (VIF), which must remain below 5 (Hair et al., 2022). To assess path coefficients (β), we used a bootstrapping procedure involving 5000 resamples. To guarantee the coefficient of determination, R^2 was evaluated for the model's predictive efficacy. Model fit was evaluated by using the standardized root mean square residual (SRMR), which should be less than 0.08, and the normed-fit index (NFI) should be more than 0.90, which indicates a satisfactory fit (Hair, Risher et al., 2019).

4. Results

4.1. Descriptive statistics and normality

Based on Table 1, the mean scores of most measurement items ranged from 3.5 to 4.3 on the five-point Likert scale, indicating generally positive student perceptions of English instructional styles, academic motivation, and academic engagement. The corresponding standard deviation values demonstrated reasonable variability in participants' responses. Furthermore, the normality of the data was assessed using skewness (γ) and kurtosis (γ_2). All values fell within the acceptable range of -2 to $+2$, indicating that the observed data approximated a normal distribution and were appropriate for subsequent Structural Equation Modelling analysis (Hair, 2014).

Table 1. Data normality and collinearity statistics

Items	Statements	Mean	SD	γ_2	γ	λ	VIF
SV1	I like viewing pre-class videos better than reading text materials for the English subject.	3.843	0.883	1.144	-0.923	0.63	1.91
SV2	The videos were helpful because I could do them on my own time.	4.259	0.779	1.953	-1.16	0.63	1.96
SV3	The videos were easy to learn from.	3.645	0.928	-0.231	-0.392	0.66	1.84
SV4	The lesson was well explained in the videos.	3.649	0.937	0.271	-0.58	0.71	1.99
SV5	The videos helped complete the exercise in the textbooks.	3.947	0.860	0.58	-0.713	0.66	1.92
SV6	The videos helped complete the in-class activities.	4.237	0.777	2.208	-1.168	0.67	1.21
SV7	The in-class activities helped me understand the knowledge covered in the videos.	4.061	0.889	0.817	-0.942	0.66	1.23
SF2	My teacher offered help to me when I had (a) problem(s) with my study.	4.278	0.836	2.366	-1.369	0.64	1.15
SF3	My teacher praises me when I do well in my homework or exercise.	3.988	0.897	0.295	-0.746	0.73	1.32
SF4	My teacher always checks my homework.	3.939	0.919	0.914	-0.881	0.74	1.59
SF5	My teacher checks if I have learnt the old lesson well before going on to the new lesson.	3.939	0.926	0.179	-0.727	0.72	1.35
SF6	My teacher always gives feedback that helps improve my understanding.	4.247	0.810	2.224	-1.256	0.75	1.67
SF7	My teacher always gives me constructive feedback on my homework.	4.020	0.856	2.138	-1.185	0.75	1.29
SA1	I feel that my English teacher provides me with choices and options.	3.720	0.889	-0.028	-0.428	0.61	1.49
SA2	I feel understood by my teacher.	4.043	0.846	0.238	-0.686	0.57	1.54
SA3	My English teacher conveys confidence in my ability to do well in my English subject.	3.618	0.904	0.120	-0.45	0.72	1.67
SA4	My English teacher listens to how I would like to do things. Students became autonomous learners	3.567	0.936	0.631	-0.791	0.70	1.45
SA5	My English teacher tries to understand how I see things before suggesting a new way to do things. Self-understanding of learning	3.682	0.886	0.025	-0.401	0.67	1.48
SA6	My English teacher encouraged me to ask questions.	4.102	0.886	1.153	-1.048	0.66	1.58
SA7	My English teacher answers my questions fully and carefully	4.198	0.846	0.881	-0.993	0.70	1.53
IM1	I prefer lesson content that really challenges me, because I think I can learn a new thing.	3.869	0.881	0.782	-0.775	0.70	1.21
IM2	I prefer a lesson that arouses my curiosity, even if difficult to learn.	4.125	0.842	1.219	-1.011	0.70	1.67
IM3	The most satisfying thing for me is trying to understand the course content as much as I can.	4.106	0.805	1.673	-1.032	0.58	1.61
IM4	I decide to choose a lesson that I think I can learn from even if I'm not sure getting a good score.	4.047	0.813	0.630	-0.746	0.63	1.35

Items	Statements	Mean	SD	γ_2	γ	λ	VIF
IM5	I prefer homework that arouses my curiosity, even if difficult to solve.	4.071	0.84	1.444	-0.991	0.71	1.35
IM6	I decide to choose an exercise that I think I can solve even if I'm not sure I'll get a good result.	3.992	0.831	1.799	-1.014	0.68	1.25
EM1	Getting a good score is the most satisfying thing for me.	4.053	1.017	0.346	-0.97	0.71	1.38
EM2	I want to get a higher score in the class than most of the other students.	3.584	1.025	-0.386	-0.371	0.71	1.45
EM3	I want to do homework or exercises well offering by teacher because I think it is important to show my ability to others.	4.078	0.85	1.042	-0.918	0.68	1.37
EM4	The most important thing for me is improving my grade or points in the course.	4.067	0.926	0.772	-0.979	0.80	1.27
EML5	My main concern in my study is getting a good grade	3.737	1.103	-0.252	-0.679	0.73	1.28
AE1	I like being in English class.	3.849	0.832	0.005	-0.427	0.79	1.54
AE2	I feel excited by my work in English class.	3.708	0.825	-0.064	-0.314	0.81	1.55
AE3	My English class is a fun place to be.	3.661	0.903	0.007	-0.43	0.79	1.43
AE4	I am interested in my work in English class.	3.739	0.834	0.447	-0.539	0.81	1.49
AE5	I feel happy in English class.	3.714	0.861	0.207	-0.503	0.79	1.56
AE6	I feel bored in English class. (REVERSED)	3.745	0.94	-0.331	-0.338	0.46	1.44
BE1	I follow the rules in English class.	4.010	0.737	1.136	-0.723	0.67	1.29
BE2	I get in trouble in English class. (REVERSED)	3.427	1.003	-0.503	-0.093	0.44	1.60
BE3	When I am in English class, I just act as if I am working. (REVERSED)	4.037	0.980	0.137	-0.863	0.63	1.56
BE4	I pay attention in English class.	3.894	0.747	0.713	-0.506	0.81	1.53
BE5	I complete my work on time for English class.	3.598	0.839	0.104	-0.292	0.70	1.65
CE1	I always check my English exercises for mistakes.	3.716	0.885	0.664	-0.721	0.76	1.32
CE2	I always study at home even when I don't have a test in English.	3.745	0.882	0.615	-0.613	0.57	1.30
CE3	I always try to watch videos about things we do in English class.	3.449	0.870	0.296	-0.416	0.67	1.49
CE4	When I read an English text, I ask myself questions to make sure I understand what it is about.	3.776	0.848	0.523	-0.583	0.69	1.64
CE5	I read extra English books to learn more about things we do in English class.	3.718	0.885	0.165	-0.523	0.76	1.42
CE6	If I don't know what an English word means when I am reading, I always do something to figure it out.	4.047	0.793	1.928	-0.983	0.61	1.40
CE7	If I don't understand what I read, I go back and read it over again.	3.951	0.819	1.478	-0.92	0.69	1.38

Notes: SD = Standard deviation; γ_2 = Excess kurtosis; γ = Skewness; λ = outer loading; VIF = Variance inflation factors

4.2. Measurement model assessment

Based on Table 2, the internal reliability was confirmed by Cronbach's Alpha (α) values ranging from 0.68 for behavioural engagement to 0.84 for affective engagement, which is considered acceptable for exploratory research. Simultaneously, the composite reliability (CR) value revealed a more robust measure, ranging from 0.79 for behavioural engagement to 0.88 for affective engagement. Additionally, the average variance extracted (AVE) revealed most of the constructs are lower than 0.50, but CR's value is greater than 0.70, and outer loading (λ) for most is greater than 0.50, which suggests each construct explains a sufficient amount of variance, confirming convergent validity. The square root of the AVE for each construct being greater than its correlations with other constructs and all HTMT ratios being below the conservative threshold of 0.90 confirmed how constructs might be discriminated between them, affirming discriminant validity. This proposed a satisfactory measurement model.

Table 2. The reliability and validity (N=510)

Constructs	AE	BE	CE	EM	IM	SF	SA	SV
AE	0.75	0.84	0.71	0.25	0.62	0.49	0.67	0.42
BE	0.64	0.66	0.77	0.29	0.61	0.57	0.66	0.45
CE	0.59	0.60	0.68	0.27	0.68	0.54	0.57	0.51
EM	0.21	0.20	0.24	0.72	0.49	0.28	0.39	0.45
IM	0.52	0.45	0.54	0.38	0.67	0.61	0.67	0.59
SF	0.41	0.43	0.44	0.23	0.49	0.71	0.84	0.58
SA	0.55	0.49	0.46	0.31	0.53	0.66	0.66	0.56
SV	0.35	0.35	0.42	0.35	0.45	0.46	0.44	0.66
α	0.84	0.68	0.81	0.78	0.75	0.80	0.79	0.78
ρ_A	0.87	0.71	0.81	0.79	0.76	0.80	0.79	0.78
CR	0.88	0.79	0.86	0.85	0.83	0.86	0.85	0.84
AVE	0.56	0.44	0.46	0.52	0.44	0.50	0.44	0.43

Notes: AE = Affective engagement; BE = Behavioural engagement; CE = Cognitive engagement; EM = Extrinsic motivation; IM = Intrinsic motivation; SF = Support and feedback styles; SA = Support for academic autonomy; SV = Support for video lecture; α = Cronbach's alpha internal consistency reliability; ρ_A = rho_A composite reliability; CR = Construct reliability; AVE = Average variance extracted; The red bi-correlation value refers to the Heterotrait-Monotrait ratio (HTMT), while the black bi-correlation value refers to the Fornell-Larcker criterion; the blue linear value refers to the square root of the average variance extracted.

Table 3. Model fit with the data of the model and coefficient of determination

Criteria	Saturated Model	Estimated Model	Endogenous constructs	R ²
SRMR	0.06	0.07	Intrinsic motivation	0.36
d_ULS	4.52	6.52	Extrinsic motivation	0.18
d_G	1.03	1.15	Affective engagement	0.42
Chi-Square	2880.04	3105.71	Behavioural engagement	0.39
NFI	0.70	0.68	Cognitive engagement	0.41

4.3. Structural model and hypothesis testing

In essence, the multicollinearity issue was not a concern, as the variance inflation factor (VIF) values for all items were well below the threshold of 2 (Table 1). The overall model fit indices indicate an acceptable fit of the model to the data (Table 3). The SRMR value of 0.06 for the saturated model is below the required threshold of 0.08, but the NFI value of 0.70 assumes a moderate fit with the data linking to the context study. The coefficient of determination (R^2) for the key endogenous constructs was explained by exogenous constructs as intrinsic motivation ($R^2 = 0.36$), extrinsic motivation ($R^2 = 0.18$), affective engagement ($R^2 = 0.42$), behavioural engagement ($R^2 = 0.39$), and cognitive engagement ($R^2 = 0.41$). These values indicate that the model explains a moderate amount of variance in these constructs, which is considered substantial in behavioural sciences.

The results of the structural model analysis are presented in Figure 1. The findings indicate that support for academic autonomy exerted the strongest positive effect on intrinsic motivation, while intrinsic motivation was the strongest predictor of students' cognitive and affective engagement. Although several direct relationships between instructional styles and academic engagement were weak or statistically non-significant, the results demonstrate that the effects of English instructional styles were primarily transmitted indirectly through intrinsic motivation. These findings underscore the central mediating role of intrinsic motivation in explaining how autonomy-supportive instructional practices enhance students' academic engagement in a flipped English language classroom.

Table 4 presents the primary results of the study, including the mediating analyses. The hypotheses tested the indirect effects of English instructional styles on academic engagement through academic motivation. All hypotheses positing intrinsic motivation as a mediator were strongly supported. The path coefficients (β) were positive and significant. Specifically, the strongest indirect effect was from support for academic autonomy by first enhancing intrinsic motivation on cognitive engagement ($\beta = 0.10$, $p < 0.05$). This direction was closely followed by the path to Behavioural Engagement ($\beta = 0.07$, $p < 0.05$) and Affective Engagement ($\beta = 0.09$, $p < 0.05$). Support for video lectures and support and feedback styles also showed significant, though slightly weaker, indirect effects on all engagement dimensions via intrinsic motivation. In stark contrast, none of the hypotheses involving extrinsic motivation as a mediator were supported. All indirect path coefficients were negligible and statistically non-significant. Likewise, support for

academic autonomy plays an important role in boosting intrinsic motivation, and intrinsic motivation is the most powerful mediator between English instructional styles and academic engagement, which is the key link to more profound student engagement in English language teaching.

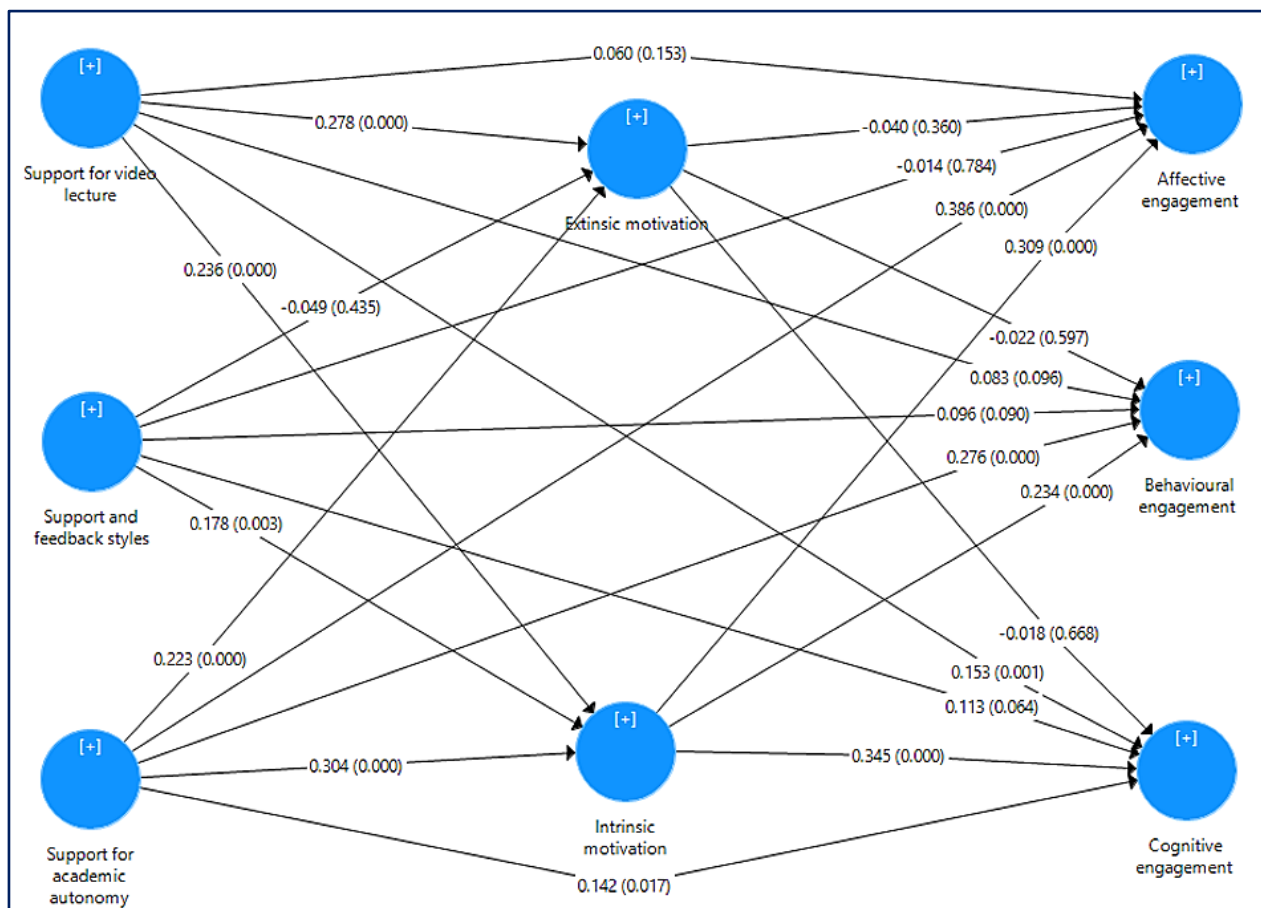


Figure 1. Structural Model Results

Table 4. Mediating analysis within 5000 times bootstrapping methods

Indirect path coefficient	β	P-value	Result
H1a: SF → EM → AE	0.00	0.64	Rejected
H2a: SA → EM → AE	-0.01	0.38	Rejected
H3a: SV → EM → AE	-0.01	0.38	Rejected
H1b: SF → IM → AE	0.06	0.01	Accepted
H2b: SA → IM → AE	0.09	0.00	Accepted
H3b: SV → IM → AE	0.07	0.00	Accepted
H1c: SF → EM → BE	0.00	0.77	Rejected
H2c: SA → EM → BE	0.00	0.62	Rejected
H3c: SV → EM → BE	-0.01	0.61	Rejected
H1d: SF → IM → BE	0.04	0.02	Accepted
H2d: SA → IM → BE	0.07	0.00	Accepted
H3d: SV → IM → BE	0.06	0.00	Accepted
H1e: SF → EM → CE	0.00	0.80	Rejected
H2e: SA → EM → CE	0.00	0.68	Rejected
H3e: SV → EM → CE	0.00	0.68	Rejected
H1f: SF → IM → CE	0.06	0.01	Accepted
H2f: SA → IM → CE	0.10	0.00	Accepted
H3f: SV → IM → CE	0.08	0.00	Accepted

5. Discussion

This study set out to unravel the mechanisms through which instructional styles influence student engagement in a flipped English language classroom. The results provide compelling evidence for a clear pathway: instructional styles that support autonomy, competence, and relatedness significantly enhance students' intrinsic motivation, which in turn is the primary driver of their affective, behavioural, and cognitive engagement. The most significant finding is the powerful and consistent mediating role of intrinsic motivation, as opposed to the non-significant role of extrinsic motivation. In this sense, this finding aligns with self-determination theory robustly.

When teachers provide choices, listen to students' opinions, and encourage questions through support for academic autonomy, they satisfy the need for autonomy, which is a fundamental fuel for intrinsic motivation (Deci & Ryan, 2000). Similarly, when video lectures are well explained and helpful, and when teachers provide timely help and feedback, they support the need for competence, which further fosters intrinsic motivation (Ruos et al., 2025). This inherent interest and enjoyment in learning English then manifest as greater happiness in class, which reflects affective engagement; more active participation, which represents behavioural engagement; and the use of deeper learning strategies, reflecting cognitive engagement (Chan et al., 2023b).

This finding revealed that extrinsic motivation (e.g., driven by reward, grades, or punishment) is not appropriate for mediating the relationship between English instructional styles and academic engagement, which suggests it is highly instructive. In the English language learning context of 12th grade, teachers can create an instructional style that slightly influences extrinsic motivation, but it does not effectively translate into genuine and profound engagement for adult learners. This aligns with previous research, which indicated that extrinsic sponsors are more likely to sometimes even undermine intrinsic motivation, that they reflect permanent curiosity, and that they are less sustainable for fostering long-term, high-quality learning (e.g., Awado et al., 2024; Chan et al., 2023b; Peng et al., 2022; Wang et al., 2019).

Among the English instructional styles, support for academic autonomy plays out as a genuine indirect effect, essentially on cognitive engagement. This finding points out the vital role of shifting from controlling and directive instructional practices to supportive approaches that empower adult learners, allowing them to take charge of their own educational journeys. The important finding further validates that carefully planned video lectures serve not practically as a logistical resource, but also as a crucial educational element that sparks curiosity and internal desire, which reflects their enjoyment and satisfaction, thereby leading to higher academic engagements.

6. Conclusion

The current study investigated the relationship between instructional styles in the flipped EFL classroom, academic motivation, and engagement of Cambodian Grade 12 learners of English as a foreign language. On the basis of Self-Determination Theory, the study found that instructional styles that foster autonomy and feedback, and enhance video-based learning, increased the academic engagement of Grade 12 students through intrinsic motivation. Out of the three dimensions of instructional styles, academic autonomy played the highest role as a predictor of motivation and engagement of Grade 12 students of the EFL class, whereas intrinsic motivation totally mediated the relationship between instructional styles and academic engagement of students. On the other hand, extrinsic motivation was not found as a mediator in any of the relationships between instructional styles and students' affective, behavioural, and cognitive engagement in this study. Thus, extrinsic motivation in the form of incentives and reward systems is not as efficient as intrinsic motivation to make EFL learners engage in their learning process meaningfully and sustainably.

The study also makes theoretical and practical contributions to the literature by proposing an integrative framework of instructional styles, motivational processes, and multidimensional engagement in a technology-enabled context. Moreover, it extends the applicability of Self-Determination Theory in the educational context of Cambodian secondary schools, demonstrating that autonomy-supportive instructional practices are essential to develop the competence, autonomy, and relatedness of students. In terms of practical implications, the findings of this study indicate that instructors in EFL classes should pay attention to developing learners' autonomy, giving them constructive feedback, and creating high-quality instructional videos that motivate students to participate actively in the learning process.

However, there are certain limitations associated with this study. First, because of the nature of the research design, causal inference could not be drawn. Also, there were certain limitations of self-report measures, which could involve social desirability bias. Additionally, because of the non-random sampling technique used in the study, results could have low external validity because the sample was selected only from one province of Cambodia. Therefore, future

research is needed to address the identified weaknesses and explore the proposed model longitudinally or experimentally using more objective measures.

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