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INSTRUCTIONAL LEADERSHIP TOWARDS BLENDED LEARNING: EFFECTS ON STUDENT ENGAGEMENT AND LEARNING SATISFACTION

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ABSTRACT

Teacher instructional leadership constitutes a critical management function in tertiary education, particularly within hybrid learning environments that require effective coordination of instructional modalities. This study explores how perceived teacher instructional leadership influences university students' satisfaction with hybrid learning, with student engagement serving as a key mediating factor. Based on a survey of 696 undergraduate students at local colleges and universities in Guangxi, China, using a quantitative approach and employing a stratified random sampling design, structural equation modeling revealed that perceived teacher instructional leadership has a significant influence on both student engagement and hybrid learning satisfaction. Additionally, student engagement positively impacts hybrid learning satisfaction, and it partially mediates the relationship between perceived teacher instructional leadership and hybrid learning satisfaction. This study aims to investigate the impact of teacher instructional leadership based on soft management approaches on student engagement and satisfaction. The results contribute to the literature on educational leadership and management by focusing on leadership approaches in the hybrid learning contexts of local colleges and universities in China.

Keywords: Hybrid learning satisfaction, student engagement, perceived teacher instructional leadership, educational management, higher education.

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INTRODUCTION

The popularity of hybrid learning in university-level education has created new challenges in terms of leadership and management, in the sense that the use of hybrid learning modalities calls for the development of harmonized organizational practices (Bruggeman et al., 2022). Informatization in higher education has created new challenges in terms of instructional governance and student support for educational managers (Cheng et al., 2023). While hybrid learning offers flexibility and innovation (Bushra et al., 2024; Sultana et al., 2025), achieving student satisfaction is largely dependent on the quality of instructional leadership (Rabby et al., 2025). Throughout this study, the terms “blended learning” and “hybrid learning” are used interchangeably, consistent with established practice in the educational technology literature (Min & Yu, 2023).

The implementation of hybrid learning within Chinese universities faces numerous challenges concerning leadership and management. For example, the lack of a structured instructional leadership framework indicates a significant gap within the organization (Ashraf, 2022). Although many studies have highlighted the significance of the course design and the technological tools used to support hybrid learning (Gepp & Kumar, 2020), the instructional leadership of teachers is crucial for fostering student development, determining learning outcomes, and facilitating effective communication (He, 2024). In addition, the hybrid learning continues to face a number of challenges, although it is not yet clear how teachers and students can interact to improve the learning outcomes (Xiao et al., 2025). The ability of instructors to motivate college students in a blended setting has been given little emphasis (Rajabalee et al., 2021). For example, instructors need to identify and examine the factors shaping student satisfaction to improve the outcomes of student learning in a blended setting (Nazeef et al., 2024). In addition, it is expected that the role of an instructor in a blended setting will involve management, design, and facilitation, as noted by Feng et al. (2019), Woltering et al. (2009), and Zu et al. (2021).

The current research defines perceived teacher instructional leadership, which includes teacher capacity to set goals, provide guidance, and motivate participation, as an educational management practice that affects student engagement and satisfaction. This research aims to examine the extent to which student engagement is a mediating variable in instructional leadership. Using the conceptual lens of Path-Goal Theory, this research extends the existing theoretical model of the antecedents of hybrid learning satisfaction. The findings suggest refinements to the conceptual model (Min & Yu, 2023).

The study contributes to the scholarship on education leadership and management, particularly in showing that teacher instructional leadership functions as a soft management mechanism that affects students' involvement and course satisfaction within hybrid learning.

LITERATURE REVIEW

Path-Goal Theory

The Path-Goal Theory is a primary theoretical construct in the study of leadership, explaining how leaders can impact the subordinate's motivation and performance through various styles of leadership (Öqvist & Malmström, 2016). This theory emphasizes the primary responsibility of leaders in clarifying goals, removing obstacles, and providing the necessary guidance and support to facilitate goal attainment, thereby enhancing both performance and job satisfaction (House, 1971).

The framework suggests that the four main styles of leadership include the directive, supportive, participative, and achievement-oriented styles (Fabac et al., 2022). The directive style is expressed by the instructor by clearly expressing expectations (Northouse, 2021). The supportive style involves encouraging college students, and the achievement-oriented style focuses on challenging college students to increase the level of participation (House & Mitchell, 1975). All these styles have been found to increase the sense of responsibility among college students,



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which in turn enhances satisfaction and effectiveness in hybrid learning environments (Rahmawati et al., 2023).

In this study, Path-Goal Theory defines teachers as instructional leaders who control learning conditions, minimize engagement barriers, and adjust teaching strategies to meet the needs of learners, which explains instructional leadership as a management approach to educational effectiveness (Shengnan & Hallinger, 2021).

Teacher Instructional Leadership as Educational Management

Teacher instructional leadership, which is defined as an educational management practice, entails goal setting, guidance provision, progress monitoring, and motivational support functions that affect student learning outcomes and satisfaction.

The empirical study indicates that a strong positive correlation exists between the perception of the students and their satisfaction with the learning environment (Cheng et al., 2023). The positive association can be partly explained by students' favourable evaluations of teacher-student instructional interactions. Such interactions effectively foster a learning environment that enhances student satisfaction (Hill & Smith, 2019). Moreover, the effectiveness of teacher strategies, particularly those emphasizing teacher-student interaction, is a critical factor influencing learners' satisfaction in hybrid learning (Cheng et al., 2023). As such, it stimulates learning motivation, improves the quality of learning outcomes, and promotes learners' holistic development (Baker, 1996; Chen, 2012). Hybrid learning satisfaction refers to learners' subjective perceptions and attitudes regarding the fulfilment of their learning expectations and needs. It encompasses multiple dimensions, including satisfaction with the course, interactions, information sharing, and learner autonomy (Lin & Cai, 2007; Ocampo, 2023). The impact of teacher instructional leadership, whereby learners' emotional needs are fulfilled, and learners are engaged in learning processes, is greatly enhanced when learners are satisfied with the learning environment (Lubis et al., 2022; Namyssova et al., 2019; Suson, 2024).

Within the general framework of educational management, instructional leadership has increasingly been theorized as an institutional form of governance, and not simply an aspect of pedagogical practice (Nguyen et al., 2020; Sebastian et al., 2019). From this perspective, teacher instructional leadership in blended learning environments thus includes not only direct instructional practices but also learning conditions, technological and human resource coordination, and monitoring student learning outcomes (Shengnan & Hallinger, 2021). This perspective on instructional leadership integrates it into the general framework of quality assurance in higher education institutions, in which individual pedagogical practices are viewed in terms of their interrelationship with broader institutional management practices. In this respect, He (2024) has specifically pointed out that instructors' ability to exercise instructional leadership in Chinese universities depends on support structures and mechanisms at the institutional level, thus implying that any improvement in students' learning outcomes can only be effectively managed through appropriate management strategies at both department and institutional levels. This perspective on instructional leadership thus further emphasizes the general significance of the current research study, in that, in theorizing instructional leadership in terms of Path-Goal Theory and analysing its effects in terms of blended learning management, it expands the general framework of educational management beyond administrative governance and into individual pedagogical practices in shaping students' learning outcomes (Thien et al., 2024).

Student Engagement

Student engagement is a managed process in the present context encompassing the energy and effort invested by the student in the learning environment, which can be quantified based on behavioural, cognitive, emotional, and technological aspects (Teng & Wang, 2021). From the managerial viewpoint, student engagement is considered an important process influenced by the managerial practices adopted by the teachers (Sebastian et al., 2019). Teacher support boosts intrinsic motivation, which positively influences student engagement (Ahn et al., 2021). Furthermore, the instructional leadership adopted by the teachers has a direct and significant impact on the commitment of the students and the teaching staff (Thien et al., 2024). Flipped learning, as a vital part of the hybrid learning process, has a considerable impact on student satisfaction due to its positive effect on student engagement (Fisher et al.,



2021). The relationship between student engagement and the expectation of trust and satisfaction in the hybrid learning process is considerable. An increased level of student engagement will allow the student to put more energy into the learning process, thus creating a considerable and direct effect on the learning outcome. The overall learning outcomes derived from the students have a significant influence on the overall student engagement; hence, there is a cyclical pattern (Bond et al., 2020). The external setting provided by the educators, defined as supportive, guiding, and achievement-oriented, is revealed to be an essential factor, along with the internal dynamic of the teacher-student relationship, in moderating the relationship between learning and satisfaction.

METHODOLOGY

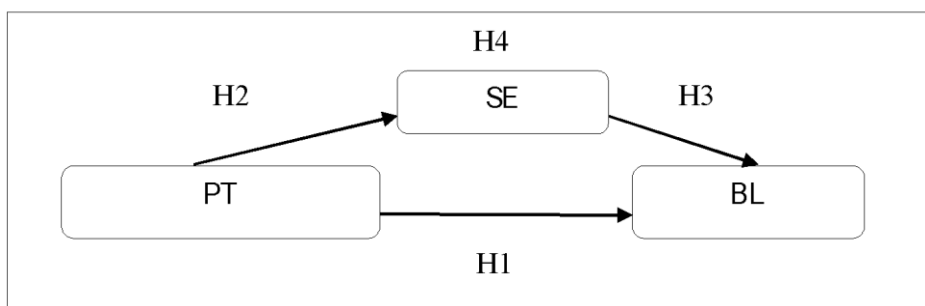
Research Design and Framework

This study employed the path-goal theory in examining the relationship that exists between teachers' instructional leadership in educational management practices and student satisfaction with hybrid learning, through student engagement. The model conceptualizes the input of the management practice, the process of the leadership, and the quality indicator of the education (Figure 1). The study participants are college students recruited from local colleges and universities in Guangxi, China. The main hypotheses are as follows:

1. H1: Perceived teacher instructional leadership positively influences hybrid learning satisfaction among college students at local colleges and universities in Guangxi, China.
2. H2: Perceived teacher instructional leadership has a positive impact on student engagement among college students at local colleges and universities in Guangxi, China.
3. H3: Student engagement is positively correlated with hybrid learning satisfaction among college students at local colleges and universities in Guangxi, China.
4. H4: Student engagement mediates the relationship between perceived teacher instructional leadership and hybrid course satisfaction among college students at local colleges and universities in Guangxi, China.

Figure 1

The Conceptual Model Showing Mediating Leadership Mechanism



Note. PT - Perceived Teacher Instructional Leadership; SE - Student Engagement; BL - hybrid learning Satisfaction

Participants and Data Collection

The research was administered to 696 undergraduate students at Guangxi University in China who had taken the hybrid learning course "Introduction to Art." The research sample comprised 316 third-year and 380 fourth-year students. The pilot test was carried out before the survey on 187 students.

Instruments

Three standardized scales were used in the study, namely, the Perceived Teacher Leadership (PT) Scale, the Student Engagement (SE) Scale, and the hybrid learning Satisfaction (BL) Scale, all of which used a five-point Likert scale with options ranging from 1 (strongly disagree) to 5 (strongly agree).



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The PT Scale, based on the measurement instrument developed by Chen (2005) Teacher Edition, includes the following dimensions: "Eliciting students' motivation to learn," "Promoting high-quality educational behaviour," "Constructive guidance," "Assisting students in overcoming learning barriers," and "Developing students' intrinsic motivation to achieve learning satisfaction." A total of 25 items were used, with examples ranging from "Teachers clarify course objectives with students" to "Teachers encourage students to exert effort." Here, the reliability coefficients of the dimensions of the PT Scale ranged from .732 to .895, and the overall reliability coefficient of the scale was .877.

The SE Scale, developed based on Teng & Wang (2021), consisted of 34 items intended to measure students' behavioural, cognitive, emotional, and educational technology engagement, including "spending a lot of time studying" and "using strategies to manage academic workload." For this study, the reliability coefficients of the dimensions of the Student Engagement Scale ranged from .851 to .906, and the overall reliability coefficient of the scale was .907.

The hybrid learning satisfaction scale, created by Lin and Cai (2007), had 16 items, aiming to evaluate college students' level of satisfaction regarding hybrid learning. Sample items of this scale were "satisfaction with online examination assessment methods," "satisfaction with website usability," and "satisfaction with teaching quality." The BL Scale demonstrated strong internal consistency ($\alpha = .958$).

Analysis of Data

Based on the pre-test analysis, this study developed a formal questionnaire. A structured survey was conducted using the questionnaire. After eliminating the invalid questionnaires, the analysis was performed using SPSS and AMOS software.

RESULTS AND FINDINGS

Descriptive Statistical Analysis

To evaluate the basic characteristics and the distribution of scale items, descriptive statistical analysis was conducted for each scale. Descriptive statistics were calculated for each scale, and the results were summarized in terms of measures of central tendency, variability, and the shape of the distribution. According to Kline et al. (2011), a criterion for approximate normality was applied, which implied that data should be regarded as approximately normally distributed when the absolute values of skewness and kurtosis fell below 3 and 10, respectively. The mean scores for the scales measuring PT, SE, and BL were 3.749, 3.678, and 3.571, respectively, indicating a high level of performance. The standard deviations for the aforementioned scales equalled .643, .702, and 1.017, respectively, which implied that the distributions of these variables in the sample had no significant differences and exhibited high consistency and similarity.

Discriminant Validity

The discriminant validity between the latent constructs was assessed through Pearson correlation analysis, supported by the average variance extracted (AVE) approach. From Table 1, correlations between constructs varied between 0.075 and 0.416. However, all correlations were significant at the 0.001 level. In line with Capron's (1999) recommendations, the average variance extracted for each construct was higher than the squared correlations between each pair of constructs. Moreover, the square root of each construct's AVE was higher than 0.500, thus meeting the a priori conditions set by Anderson and Gerbing (1988).

Table 1
Correlation Analysis and Discriminant Validity Across Dimensions

	M	SD	PT1	PT2	PT3	PT4	PT5	SE1	SE2	SE3	SE4	BL
PT1	3.756	1.009	.768									



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PT2	3.711	.995	.343**	.767									
PT3	3.813	1.048	.333**	.384**	.766								
PT4	3.776	.968	.242**	.234**	.242**	.752							
PT5	3.728	1.002	.228**	.243**	.255**	.120**	.748						
SE1	3.540	1.065	.096*	.116**	.160**	.105**	.089*	.761					
SE2	3.725	.976	.180**	.223**	.199**	.075*	.153**	.263**	.759				
SE3	3.689	1.023	.249**	.298**	.223**	.160**	.145**	.277**	.416**	.767			
SE4	3.743	.971	.091*	.151**	.163**	.087*	.096*	.272**	.336**	.330**	.762		
BL	3.571	1.017	.151**	.352**	.187**	.177***	.212**	.239**	.318**	.300**	.252**	.763	

Note. M - Mean; SD - Standard Deviation; PT1 - Stimulates students' desire for learning; PT2 - Achieves high-quality educational practices; PT3 - Provides constructive guidance and clear learning direction; PT4 - Helps students overcome learning barriers; PT5 - Motivates students to enhance learning satisfaction; SE1 - Behavioural engagement; SE2 - Cognitive engagement; SE3 - Emotional engagement; SE4 - Educational technology engagement; BL - hybrid learning Satisfaction

Common Method Variance Test and Correlation Analysis

To deal with the possible common method bias, the single-factor test proposed by Harman was used, as suggested by Zhou and Long (2004). In this study, ten factors with an eigenvalue higher than 1 were extracted, with the largest factor accounting for 22.707% of the total variance, far less than 40%. The Kaiser–Meyer–Olkin value was .943, while Bartlett's test of sphericity was significant, indicating that common method bias is not a concern in this study. Bivariate correlations, as proposed by Qiu Haozheng in 2010, were used to examine the correlations among the variables, as shown in Table 2. All the correlations are modest, ranging from .318 to .394, with no correlations higher than .7, indicating that there is no multicollinearity among the variables. TP is positively correlated with SE ($r = .318$, $p < .001$) and has a moderate positive correlation with BL ($r = .352$, $p < .001$); SE is positively correlated with BL at a moderate level ($r = .394$, $p < .001$).

Table 2
Correlation Analysis of Variables

Factors	M	SD	TP	SE	BL
TP	3.749	.643	1		
SE	3.678	.702	.318***	1	
BL	3.571	1.017	.352***	.394***	1

Note. M - Mean; SD - Standard Deviation; TP - Perceived Teacher Instructional Leadership; SE - Student Engagement; BL - hybrid learning Satisfaction

Mediated Model Analysis of Student Engagement (SE)

The structural equation modelling revealed that, as presented in Table 3, the BL variable was observed, whereas



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the PT and SE variables were considered latent variables. A significant positive correlation was observed among the variables. All the goodness-of-fit measures, including GFI, NFI, NNFI, and CFI, were greater than 0.900, which supported the criteria presented by Hair et al. (2019). The value of the RMSEA was less than 0.080, whereas the χ^2/df ratio was 1.140, which was less than 5.00 as recommended by Schumacker and Lomax (2004).

Figure 2 shows the path relationships, and the perceived teacher instructional leadership positively affects hybrid learning satisfaction ($\beta = .228, t = 3.622$), thus supporting H1. Furthermore, perceived teacher instructional leadership positively affects student engagement ($\beta = .550, t = 5.996$), thus supporting H2. Finally, student engagement positively affects hybrid learning satisfaction ($\beta = .372, t = 5.435$), thus supporting H3.

The current research utilized a Bootstrap method for mediation analysis with a structural equation modelling design. The Bootstrap sample size is 2000, and a 95% CI is conducted for the analysis. The 95% CI for the path coefficient should exclude zero for the mediation effect to be significant (Cheung & Lau, 2008; Diccio & Romano, 1988; Lau & Cheung, 2012). As shown in Table 4, the direct effect is statistically significant as it is outside the 95% confidence interval range. The result indicates that perceived teacher instructional leadership (PT) has a significant positive effect on blended learning (BL) without mediation. The indirect effect of student engagement (SE) is statistically significant; thus, it is a viable mediator for perceived teacher instructional leadership (PT) that impacts blended learning satisfaction.

Table 3
Measurement Model Fit Index Test

Type of Fit Index	Evaluated Item	Fit Criteria	Observed Value	Model Fit Assessment
	χ^2/df	< 5	1.140	Fit
Absolute Fit Index	GFI	> .900	.966	Fit
	AGFI	> .900	.959	Fit
	SRMR	< .080	.041	Fit
	RMSEA	< .080	.014	Fit
	NFI	> .900	.965	Fit
Incremental Fit Index	NNFI	> .900	.995	Fit
	CFI	> .900	.996	Fit
	RFI	> .900	.962	Fit
	IFI	> .900	.996	Fit
Parsimonious Fit Index	PNFI	> .500	.875	Fit
	PGFI	> .500	.808	Fit
	CN	> 200	699	Fit



Figure 2
Research Model Framework Diagram

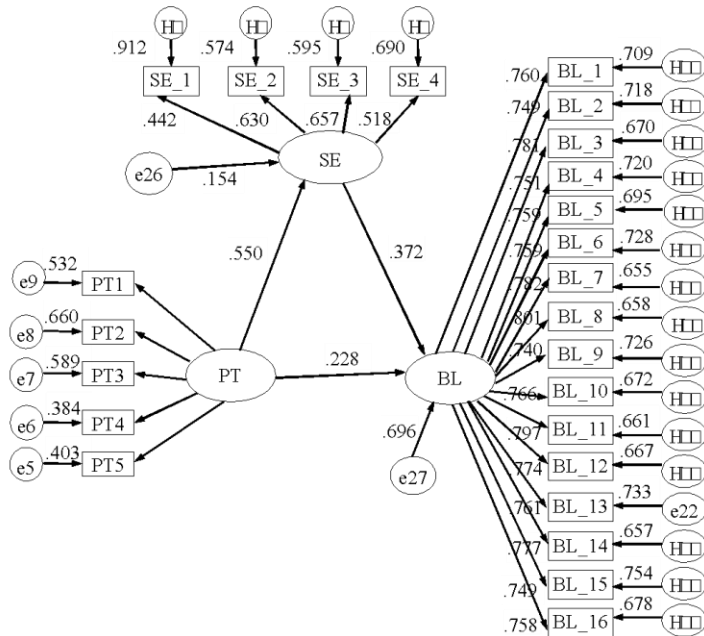


Table 4
Bootstrap Test of Mediation Effect

Mediation Path	Effect	Estimate	95% CI		P value
			Lower Bound	Upper Bound	
	Direct Effect	.228	.061	.362	< .001
PT --> SE --> BL	Indirect Effect	.205	.124	.334	< .001
	Total Effect	.433	.350	.512	< .001

Note. PT - Perceived Teacher Instructional Leadership; SE - Student Engagement; BL - hybrid learning Satisfaction

DISCUSSION

This study reinforces the understanding that satisfaction with hybrid learning can be improved by enhancing teacher instructional leadership and student engagement. PT demonstrated a robust positive effect on both SE and BL, with SE serving as a mediator. Overall, this study suggests that, compared to optimizing the technical platform, information literacy, or content design (Ashraf et al., 2022), a priority for higher education is to strengthen perceived teacher instructional leadership (Thien et al., 2024) in a hybrid learning environment. The mediator effect of SE is evident: without student engagement, a positive environment and tools are not enough to achieve a high level of satisfaction. Therefore, teachers must make student engagement a central aspect of hybrid learning and teaching.

Teacher Instructional Leadership as a Management Mechanism for Satisfaction

This study demonstrates that teacher instructional leadership has a positive effect on student satisfaction with hybrid learning, which is consistent with findings by Cheng et al. (2023) and Suson (2024). The findings affirm the role of instructional leadership as a soft management practice used by teachers to influence student satisfaction. In



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practical terms, integrating instructional leadership as an educational management practice enhances the overall quality of hybrid learning. As noted by Haw and King (2023), teacher leadership significantly improves student learning satisfaction by better addressing the fundamental psychological needs of students. For instance, the teacher defines clear goals, gives timely feedback, and helps students with learning difficulties. PT exerts a significant effect on BL via multiple channels, including both direct and mediated effects.

From an institutional management perspective, the present research has direct implications for faculty development programs and governance structures related to blended learning in universities. Indeed, institutions that integrate instructional leadership competencies into faculty performance evaluation and faculty development programs are likely to achieve sustainable gains in student satisfaction (Nguyen et al., 2020). As such, chairs and administrators in departments must extend beyond pedagogical training programs to include formal instructional leadership development programs that explicitly address goal setting, motivational support, and adaptive instructional support—core management competencies that this research has shown to be critical to engagement and satisfaction outcomes. As such, quality assurance systems must recognize teacher instructional leadership as a primary governance indicator that merits systematic monitoring and institutional investment.

Instructional Leadership Influence on Engagement as a Managed Outcome

Consistent with Thien et al. (2024) and Liu et al. (2021), this study confirms that PT exerts a meaningful positive influence on SE. When students perceive instructional leadership from their teacher, this enhances learning engagement (Abrami & d'Apollonia, 1999). Teachers who demonstrate instructional leadership create a conducive learning environment that is warm and fair, which enhances student engagement and expectancy-value-oriented behaviours. Within hybrid learning environments, such teachers promote self-efficacy, motivation, and meaning for the learners by facilitating goal setting, guidance, feedback, individualized learning, and developing a conducive learning environment (Gage et al., 1996). Instructional leadership enhances interaction and application by facilitating collaboration and inquiry learning (Boekaerts, 2002). Universities should focus on the development of an integrated teaching leadership model (Ajayi & Otoide, 2020), and the use of student-centric practices should be encouraged to develop an inclusive and trustworthy learning environment that promotes students' engagement.

Student Engagement as a Leadership-Driven Pathway to Satisfaction

Learner engagement demonstrated a robust positive effect on BL satisfaction, which aligns with the study results obtained by Fisher et al. (2021) and Lane et al. (2021). Student participation in online discussions, collaboration, and the accomplishment of quality tasks increases students' engagement and a sense of belonging (Boekaerts, 2002). In particular, active student participation enhances peer interactions and teacher adaptations to maintain a collaborative, open, and trustworthy learning environment (Baker et al., 2018; Bloomfield, 2009; Davis, 2024).

Student Engagement as a Mediating Leadership Mechanism

This study reveals that, within the hybrid learning environment of local colleges and universities in Guangxi, China, SE has a meaningful impact on BL and, while simultaneously being a mediator of the PT-BL relationship. The results obtained are in line with the results of previous studies (Fisher et al., 2021; Goh & Yang, 2021), suggesting that the instructional leadership of the teacher can have an indirect impact on the instructional satisfaction of the students. Reflective teaching strategies, such as the flipped classroom, are found to increase student participation, thus enriching the learning experience (Fisher et al., 2021). When teachers successfully integrate online technologies with appropriate support and guidance, student engagement in online environments is enhanced (Goh & Yang, 2021). The instructional leadership provided by teachers, represented by timely feedback and collaborative tasks, has been shown to affect the cognitive development of students, and at the same time, it enhances the social connectedness of the students, thus leading to satisfaction through multidimensional mechanisms of student engagement (Chen et al., 2023).

The results suggest that higher education institutions should place greater emphasis on developing teachers' instructional leadership competencies, especially in the following areas: technology coordination, collaborative



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learning, and emotional support. Faculty development programs should be redesigned to treat instructional leadership as a core professional competency, incorporating training modules that address goal articulation, motivational scaffolding, and adaptive feedback delivery within blended learning contexts. At the institutional governance level, chairs and directors are encouraged to integrate instructional leadership indicators into formal teaching evaluation systems and quality assurance frameworks for blended learning, providing a structural mechanism through which leadership quality is monitored and improved as a measurable institutional outcome. The evidence of student engagement as a mediating pathway further suggests that engagement metrics should be embedded within these assessment frameworks as process indicators rather than treated solely as outcome variables. Continued investigation into the mediational pathways and multidimensional aspects of engagement as institutionally managed processes remains a productive direction for future scholarship.

CONCLUSION

This study examined the effects of teacher instructional leadership on learner involvement and satisfaction in a hybrid learning environment, with a sample of 696 college students in Guangxi. Findings indicate that instructional leadership acts as a management tool that directly affects student satisfaction and indirectly affects student engagement. The partial mediation effect supports the argument that developing instructional leadership capabilities represents a key strategy for enhancing learning outcomes in higher education.

Practical implications include designing faculty leadership training programs, establishing leadership standards for hybrid learning contexts, and incorporating student engagement into institutional quality assurance frameworks. Teaching guidance serves as a soft management approach (Ulmira, 2025) that enhances overall satisfaction by stimulating students' involvement in the learning process. Further studies could explore the long-term effects of student engagement, including the effectiveness of intervention strategies, in a hybrid learning scenario.

RECOMMENDATIONS

Based on the findings, the following research directions are proposed to advance future theoretical and practical applications: Future research should explore the relationship between subject matter expertise and instructional leadership competence (Mafa-Theledi, 2024), which could inform the development of holistic leadership standards for higher education. Future research should consider the effects of individual differences among students (Agormedah, 2025). Student variables, including age, academic background, and learning experience in hybrid learning, may influence satisfaction perception; thus, future research should explore these variables to improve the development of differentiated teaching methods. Evaluating the effectiveness of instructional leadership training programs should also be prioritized (Rexhepi et al., 2024), as findings could improve the development of policies in higher education institutions regarding faculty training programs in hybrid learning environments. Future research in feedback mechanisms should continue to be prioritized (Sharif & Atif, 2024). Considering the significant impact of feedback on student motivation and satisfaction, future research could investigate how timely and effective feedback from teachers and peers could influence the learning environment.

Further exploration of the relationships among teacher leadership, student engagement, and contextual variables would reinforce the development of a hybrid learning intervention strategy, where student engagement is considered a key indicator of the effectiveness of teacher leadership and quality assurance in education.

LIMITATIONS

The sampling frame for the current research was local colleges and universities in Guangxi, China. The study aimed to investigate the relationships between perceived teacher instructional leadership, student engagement, and satisfaction with hybrid learning, leading to the development of an empirical model for verification. Despite the significance of the findings, certain limitations must be recognized.



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The geographic concentration of the sample in Guangxi, China, limits the generalizability of the findings to other Chinese provinces and international higher education contexts characterized by different pedagogical cultures and institutional governance arrangements. The cross-sectional design also constrains causal directional inference from the SEM results; although significant path coefficients were identified, the temporal ordering of the relationships cannot be confirmed from a single time-point survey. Reliance on self-reported instruments across all three constructs introduces the potential for common method variance, though the Harman single-factor test reported in Section 4.3 suggests this is not a primary concern in the present dataset. Longitudinal and multi-source designs are recommended for future investigation. Future studies should employ a bidirectional model that accounts for the reciprocal influence of student satisfaction on teachers' instructional behaviour and leadership style. The research focused exclusively on teachers' individual instructional leadership without considering the organizational setting. Future investigations should be conducted considering the influence of organizational leadership climate and support systems for departments on individual teachers' leadership behaviours (Nguyen et al., 2020).

ETHICS STATEMENTS

The studies involving human participants were reviewed and approved by the Behavioural, Social, and Humanities Research Ethics Committee (BSH_Dhurakij Pundit University), Thailand. The participants provided their written informed consent to participate in this study.

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