# STUDENT ENGAGEMENT IN HIGHER EDUCATION INSTITUTIONS: THE INFLUENCE OF TEACHING STYLE, SOCIAL MEDIA USE, AND TEACHER ROLE

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#### SUMMARY

The purpose of this research was to develop and validate a model for integrating the variables influencing Student Engagement (SE) in Higher Education Institutions (HEIs). The PLS-SEM method was employed to assess a hierarchical reflective-formative model of SE. Reflective indicators were utilized to measure the lower-order constructs, while the higher-order construct was assessed through three formative subconstructs: Teaching Styles (TS), Use of Social Media (USM), and Role of Teacher (RT). The model was tested in a developing country (Peru), and a control variable was included to determine whether the model varies based on the characteristics of two other countries (Chile and Colombia). The RT showed a positive and significant impact on SE levels, as did the TS and USM. The control variable demonstrated that student engagement may vary depending on macroeconomic conditions, teaching methodologies, and available resources within educational institutions in each country. These findings provide relevant insights for educational policymakers, teachers, and university administrators in the countries studied.

#### Introduction

E is a critical area of study for HEIs (Kocsis and Molnár, 2024) because it can impact multiple outcomes, including learning, retention, satisfaction, and academic performance (Heilporn *et al.*, 2024); therefore, understanding how to foster SE is essential in university education (Korhonen *et al.*, 2024). Research on SE in this sector is particularly relevant for HEIs, which encounter several challenges. For instance, beyond the difficulty of maintaining student motivation (Nkomo *et*  al., 2021), these institutions have recently been required to rapidly implement new TS in place of traditional teaching techniques (Adedoyin and Soykan, 2023). Consequently, it is important to examine the impact of this new teaching environment on SE, as students who are more engaged typically achieve better academic outcomes (Chen and Beresford, 2023). Furthermore, these challenges must be further explored in developing countries, where students' passive role in their learning and low levels of engagement are common in many HEIs (Núñez-Naranjo, 2024). However, limited research has focused on the factors that influence SE in higher education institutions across different countries (Maloshonok, 2024).

To address these gaps, this study proposes and evaluates a model that incorporates various theoretical antecedents related to SE, including teaching style and the use of social media. The paper begins by reviewing related literature and summarizing the study's hypotheses. The empirical study's methodology is then outlined, followed by a presentation of the findings. The report concludes with a discussion of key findings and recommendations for future research.

#### KEYWORDS / Higher Education / Role of Teacher / Student Engagement / Teaching Style / Use of Social Media /

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### Theoretical Framework and Research Hypotheses

#### Student engagement

Interest in studying SE has grown significantly in recent decades due to its potential to address critical educational issues, such as enhancing learning and producing employable graduates (Mooney, 2023). However, further research is necessary to establish a unified theoretical framework and definition for SE, addressing existing conceptual incon-(Wong *et al.*, sistencies 2024). Additionally, to prevent overlaps with related concepts, future studies should clarify the foundational elements of engagement (Wong and Liem, 2022). Consequently, relevant research suggests that student involvement is a multifaceted phenomenon that includes psychological, behavioral, and cognitive dimensions and is considered a meta-construct (Heilporn et al., 2024; Szabó et al., 2024). Moreover, several factors, such as teaching style, social media usage, and instructor roles, have been identified as

influential in shaping student involvement (Chatterjee and Parra, 2022; Wang, 2022).

#### Conceptual model

Figure 1 illustrates the model proposed for this research, which establishes the relationship between the independent variables (TS, USM, RT), the dependent variable (SE), and the control variable (country effect).

#### Teaching style

TS is commonly understood as a set of teaching behaviors, methods, or strategies, or as the qualities and approaches that define how instructors manage their classes (Grasha, 2002). It also refers to the preferred way of solving problems, completing tasks, and making decisions in the teaching process, representing one of the primary factors that contribute to the success of the complex teaching-learning process (Artvinli, 2010). The literature also indicates that authors have employed various classifications of TS, though its operationalization remains a subject of debate (Flunger *et al.*, 2024). An operationalization proposed by Abello *et al.* (2020), utilized in other studies, defines TS as including the following dimensions: teacher-student interaction, decision-making negotiation, student perception of course structure, and teacher control over students.

## Influence of teaching style on student engagement

The literature indicates that TS can significantly influence SE (Huang, 2024). This influence is observed across different educational levels, where adapting TS to increase student engagement is increasingly recognized (Martín-Sómer *et al.*, 2024). Likewise, HEIs have acknowledged that teachers must adapt their TS to changing educational environments to maintain SE (Hews *et al.*, 2022). Thus, given the evidence that TS directly impacts student engagement (Johannesson, 2024), the following hypothesis is proposed:



Figure 1. Conceptual model.

H1: Teaching style positively influences student engagement.

#### Use of social media

Within the educational context, USM has become an integral part of students' lives, serving as a platform for communication and information exchange (Zhang *et al.*, 2024). Despite this, a gap remains in the literature regarding the impact of social media on students' learning engagement (Yılmaz and Yılmaz, 2022). Thus, further research is required to assess students' perspectives in these contexts, particularly in developing countries (Alalwan, 2022), given the limited empirical evidence supporting current theoretical frameworks (Papademetriou *et al.*, 2022).

Although numerous models attempt to explain the adoption of USM, one of the most widely used is the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh *et al.*, 2003). The UTAUT model includes five main variables: performance expectancy, effort expectancy, facilitating conditions, management engagement, and social media use (Albanna *et al.*, 2022).

## Influence of social media on student engagement

Previous research in education has demonstrated that USM can enhance SE (Clark et al., 2017). One reason for this relationship is that USM serves as a communication channel that fosters institutional collaboration among students Bhornya, 2022). (Chaudhari and Furthermore, USM supports participatory learning (Celik et al., 2022) and contributes to the academic success of students in HEIs (Kalam et al., 2023). Although there is a consensus that the use of USM in higher education can increase SE (Lin et al., 2023), the literature indicates that HEIs should continue to explore how to effectively utilize USM to enhance SE (Alshammari et al., 2024) due to the current lack of robust empirical evidence on this topic. Based on this, the following hypothesis is proposed:

**H2**: There is a positive influence of USM on student engagement.

#### Role of teacher

Previous studies have established that teachers significantly influence students' knowledge, skills, and academic outcomes (Schultz and Ravitch, 2013). Therefore, the professional role of the teacher (RT) is critical for both institutions and students (López-Martín *et al.*, 2023). This importance becomes particularly evident in contexts where students are required to invest greater effort in accessing materials and acquiring knowledge (Szymkowiak *et al.*, 2021).

### Influence of the role of teacher on student engagement

Recent studies in the field of education have highlighted the impact of teachers on student engagement (Zeinstra et al., 2023). Among the factors that contribute to this influence, the following are commonly cited: interpersonal relationships (García-Mova et al., 2019). the impact on student learning (Saucier et al., 2022), students' perceptions of their teachers (Snijders et al., 2022), and the emotional connection between students and instructors (Manu et al., 2021). Additionally, numerous studies have demonstrated that teacher support and presence are significant predictors of SE (Yang and Ghislandi, 2024). Furthermore, positive student-teacher interactions have been consistently associated with higher levels of student engagement in HEIs.

This connection was also observed during the pandemic, where teacher support for remote teaching methods was positively correlated with SE (Nordmann *et al.*, 2020). In the post-pandemic context, recent research suggests that the role of the teacher will remain critical in fostering SE (Metaria and Cahyono, 2024). However, despite the recognized importance of RT in engagement, this effect remains underexplored (Jia and Cheng, 2024). Based on this, the following hypothesis is proposed:

H3: There is a positive influence of the role of the teacher on student engagement.

#### Control variable: Cross-country differences in student engagement

The literature indicates that SE can vary depending on macroeconomic conditions and the resources available at educational institutions in each country (Santos et al., 2023). For this reason, some studies have established that the relationship between SE, teaching methodologies, and academic outcomes may differ according to cultural and national contexts (El-Sabagh, 2021). Thus, cultural differences in this area warrant further investigation (Öz and Boyaci, 2021). In this study, the selection of control countries (Colombia and Chile) was based on the identification of a gap in the literature. Prior research has already

examined certain aspects related to education in these countries (UNESCO, 2022).

#### Sample

A systematic, probabilistic sampling procedure was employed, and, using a proportional sampling approach, the following sample sizes were obtained: The Peruvian sample included 391 students, of whom 45% were male and 55% were female. The Colombian sample included 388 students, of whom 41% were male and 59% were female. The Chilean sample included 389 students, of whom 46% were male and 54% were female.

Confirmatory Factor Analysis (CFA) was subsequently conducted, as CFA provides essential information about the dimensionality and validity of the scales (Borsci *et al.*, 2023). Table I presents the items retained for each scale, based on the indices obtained, which demonstrated satisfactory levels.

#### Results

#### Assessment of the measurement model

Table II presents the assessment of indicator loadings. Since the standardized outer loadings exceed 0.70, they meet the criteria recommended by Hair et al. (2011). Additionally, the quality of the measurement model was assessed using the validity and reliability coefficients of latent variables. Convergent validity assesses the level of correlation among multiple indicators of the same construct, ensuring they are in agreement (Hair et al., 2017). Convergent validity was evaluated following the Fornell and Larcker (1981) criterion, which uses the Average Variance Extracted (AVE) to represent the average amount of variance that a construct explains in its indicators relative to the overall variance of its indicators (Cheung et al., 2023). This approach requires that the AVE exceed 0.5 to demonstrate an acceptable level of convergent validity, meaning that the latent construct accounts for no less than 50% of the indicator variance. As indicated in Table II, all measures of the latent variables demonstrated robust reliability, with composite reliability coefficients ranging from 0.838 to 0.921 (Hair et al., 2019).

Discriminant validity was evaluated using the Fornell-Larcker criterion (Fornell and Larcker, 1981) and the Heterotrait-Monotrait (HTMT) ratio (Henseler and Ringle, 2015), both appropriate for reflective constructs 
 TABLE I

 SCALE DIMENSIONALITY AND VALIDITY – CONFIRMATORY FACTOR ANALYSIS

Constructs	R <sup>2</sup> *	RMSEA	CFI	TLI	SRMR
Teaching Style					
Teacher-student Interaction	0.933	0.167	0.918	0.914	0.051
Decision-making Negotiation	0.896	0.147	0.939	0.980	0.044
Structuring of teaching	0.894	0.118	0.974	0.948	0.026
Control	0.905	0.186	0.914	0.936	0.051
Use of social media					
Expectation	0.900	0.264	0.939	0.917	0.049
Effort	0.938	0.187	0.980	0.940	0.019
Facilitating Conditions	0.902	0.247	0.949	0.905	0.040
Commitment	0.885	0.089	0.992	0.976	0.016
Use	0.850	0.000	1.000	1.000	0.000
Role of Teacher					
Trust	0.899	0.000	1.000	1.000	0.000
Honesty	0.892	0.000	1.000	1.000	0.000
Affect	0.919	0.000	1.000	1.000	0.000
Satisfaction	0.919	1.000	1.000	0.000	0.919
Positive Relationships	0.920	0.158	0.982	0.915	0.947
Student Engagement					
Conative	0.864	0.000	1.000	1.000	0.000
Afective	0.902	0.201	0.920	0.914	0.059
Cognitive	0.896	0.148	0.938	9.280	0.052

\*p< 0.000. TS-Teaching Style, USM-Use of Social Media, RT-Role of Teacher, SE-Student Engagement; R2- Coefficient of determination; RMSEA-Root mean squared error of approximation; CFI-Comparative fit index; TLI-Tucker Lewis index; SRMR-Standardized root mean squared residual. n= 391.

(Rasoolimanesh, 2022). As shown in Table III, the square root of the AVEs for all variables, located along the matrix diagonal, is greater than the corresponding correlations in the respective rows and columns, confirming the quality of the reflective model (Hair *et al.*, 2014). Additionally, Table III indicates that the HTMT values for all variable pairs are below the threshold of 0.90 (Henseler *et al.*, 2016), thereby confirming discriminant validity.

#### Hypothesis testing

Before testing the hypotheses, the Variance Inflation Factor (VIF) was calculated to assess the collinearity among the predictor variables (Hair *et al.*, 2016). The VIF values obtained were 1.953, 1.247, and 1.740, all below the threshold of 3, indicating that collinearity is not a concern in this model, as VIF values below 3 are generally considered acceptable (Hair *et al.*, 2021).

Following this, the research hypotheses of the proposed model were evaluated using a bootstrapping procedure to generate 95% confidence intervals (Anderson and Gerbing, 1984). Additionally, the analysis of path coefficients and corresponding p-values confirmed that all three path relationships were statistically significant.

#### Assessment of the structural model

Table IV presents the results obtained for the second-order formative construct SE. Initially, the model was tested without including the control variable. The model fit was assessed using the standardized root mean square residual (SRMR) and the root mean square error of approximation (RMSEA) (Henseler et al., 2016). For this model, the SRMR (0.06) is below the recommended threshold of 0.07, and the RMSEA (0.06) is also within the acceptable range of less than 0.08, indicating good model fit (Hu and Bentler, 1999). Additionally, the normed fit index (NFI) of 0.939, which exceeds the threshold of 0.90 (Byrne, 1994), further confirms a strong model fit. Moreover, the adjusted  $R^2$  criterion was used to assess the explanatory power of the model (Shmueli and Koppius, 2011), which indicates the proportion of variance explained by the predictor constructs. As shown in Table IV, 0,472% of the variance in SE is explained by TS, USM, and RT.

The next phase involved testing the model with the inclusion of the control variable (representing cross-country differences in SE). To evaluate this effect, a two-step approach was adopted (Bowen and Guo, 2011). This approach is comparable to including a covariate in ANOVA, where it is assumed that if the goodness-of-fit index (GFI) remains consistent across both models, the control variable does not significantly affect the model. However, if the  $\Delta CFI$  value increases by more than 0.01, it may indicate a significant impact of the control variable on model fit.

As shown in Table IV, the path coefficients and p-values indicate that all three path relationships

Constructs	Standardized outer loadings	Alpha de Cronbach	Composite reliability	AVE
Teaching Style		0.891	0.895	0.755
Teacher-student Interaction	0.856			
Decision-making Negotiation	0.897			
Structuring of teaching	0.888			
Control	0.832			
Use of social media		0.876	0.856	0.650
Expectation	0.681			
Effort	0.800			
Facilitating Conditions	0.777			
Commitment	0.731			
Use	0.713			
Role of Teacher		0.916	0.921	0.749
Trust	0.880			
Honesty	0.881			
Affect	0.864			
Satisfaction	0.845			
Positive Relationships	0.857			
Student Engagement		0.832	0.838	0.749
Conative	0.824			
Affective	0.907			
Cognitive	0.863			

 TABLE II

 EVALUATION OF THE MEASUREMENT MODEL (REFLEXIBE CONSTRUCTS)

TS-Teaching Style, USM-Use of Social Media, RT-Role of Teacher, SE-Student Engagement. n=391.

DISCRIMINANI VALIDITY ASSESSMENT						
Fornell & Larcker	1	2	3	4		
1. Teaching Style	0.872					
2. Use of Social Media	0.429	0.751				
3. Role of Teacher	0.646	0.277	0.866			
4. Student Engagement	0.621	0.491	0.489	0.873		
Heterotrait-Monorait Ratio (HTMT)	1	2	3	4		
1. Teaching Style						
2. Use of Social Media	0.501					
3. Role of Teacher	0.710	0.323				
4. Student Engagement	0.611	0.583	0.554			

#### TABLE III DISCRIMINANT VALIDITY ASSESSMENT

n=391.

remain significant even after including the control variable, confirming the validity of hypotheses H1, H2, and H3. The inclusion of the control variable also had a positive and statistically significant effect ( $\beta$ = 0.133, p< 0.000) on SE. This addition resulted in an increase in the Adjusted R<sup>2</sup> to 0.489 and a  $\Delta$ CFI greater than 0.01 (0.017). These findings support the assertion that SE can vary depending on macroeconomic conditions and the resources available at HEIs in the studied countries (Santos *et al.*, 2023; UNESCO, 2022).

Finally, Figure 2 provides a graphical representation of the significance and direction of the path coefficients, validating the hypotheses even with the inclusion of the control variable. The figure also presents the estimated coefficients ( $\lambda$ ) to illustrate the contribution

 TABLE IV

 ESTIMATION OF THE STRUCTURAL MODEL – PATH COEFFICINENTE (FORMATIVE CONSTRUCTS)

	Without C	ontrol Variable	With Control Variable	
Research hypotheses	Original coefficient	Average coefficient with bootstrap	Original coefficient	Average coefficient with bootstrap
H.1 TS $\rightarrow$ SE	0.285***	0.288***	0.273***	0.276***
H.2 USM $\rightarrow$ SE	0.145***	0.148***	0.154***	0.157***
H.3 RT $\rightarrow$ SE	0.406***	0.406***	0.387***	0.387***
$VC \rightarrow SE$			0.133***	0.132***
Adjusted R2	0.472		0.489	
CFI	0.948		0.963	
GFI	0.915		0.917	
NFI	0.939		0.956	
RMSEA	0.068		0.061	
SRMR	0.069		0.054	

n=391; p\*<0.05 p\*\*<0.01 p\*\*\*<0.001. TS-Teaching Style, USM-Use of Social Media, RT-Role of Teacher, SE-Student Engagement, VC- Control Variables (n Chile= 389; n Colombia= 388). The statistics have been obtained using a bootstrap procedure of 1000 replications and 456 calculations.



Figure 2. Structural model.

of lower-order indicators to their respective higher-order constructs. It additionally includes the Bias-Corrected and Accelerated (BCa) confidence intervals obtained through a bootstrapping method, using 1000 replications and 456 calculations. Statistical significance at the 1%, 5%, and 10% levels are indicated by \*\*\*, \*\*, and \*, respectively.

#### Discussion

The research findings support the acceptance of H1, confirming that TS significantly influences SE. TS emerges as a critical factor in promoting SE, particularly in styles that encourage participation and autonomy, which contribute to the production of employable graduates (Mooney, 2023). Additionally, recent studies have identified TS as a core component of the academic environment, which serves as a significant predictor of SE (Karabchuk and Roshchina, 2022), further validating the current research results.

Based on the findings from the research model, it is concluded that USM positively influences SE, leading to the acceptance of H2. This outcome aligns with the perspective that technology use enhances SE in HEIs by promoting collaborative engagement, satisfaction, and effective learning (Manca, 2020). Furthermore, the results confirm that USM fosters SE by facilitating community building, idea sharing, and improving academic performance (Celik *et al.*, 2022; Clark *et al.*, 2017).

The analysis also demonstrates that RT significantly influences SE, thereby supporting the acceptance of H3. These findings are consistent with prior literature, which has extensively documented the critical role of RT in student engagement (Pedler *et al.*, 2020; Petrasek *et al.*, 2022). Moreover, recent studies have highlighted that interpersonal relationships between teachers and students positively impact SE, reinforcing the importance of teacher-student connections for learning outcomes (Saucier *et al.*, 2022; Zeinstra *et al.*, 2023).

The inclusion of the control variable further confirms that SE can vary depending on macroeconomic conditions, teaching methodologies, and the resources available at HEIs in different countries. Nonetheless, the results also indicate that the proposed hypotheses remain robust and valid, despite these cultural differences.

#### Conclusions

The results obtained help address a gap in the existing knowledge, as recent studies have noted that the influence of teachers on SE has been a relatively underexplored area. It is important to note that this relationship remains significant even after including the control variable in the evaluated model, suggesting that the conceptual conclusions may also be applicable to other developing countries.

The findings have implications for educational policymakers in the country studied. Given the significance of university dropout rates, educational authorities could launch public campaigns to promote and manage the actions identified in this research.

For teachers, the results provide insights into actions within their control, such as their role and TS, as well as other factors that can impact student engagement, learning, and classroom behavior.

For university administrators, the insights from this research can guide decisions about the types of teaching models that could optimize SE. Given the evidence that effective models must account for the individualized nature of student participation and incorporate technology to enhance interaction among students, teachers, and HEIs.

Moreover, a more comprehensive understanding of some of the variables used in this study is recommended. Since engagement has primarily been examined from the student perspective, it is likely that additional psychological variables warrant analysis. For instance, the influence of value systems, attitude formation, and cognitive biases that students might have towards the educational strategies promoted by teachers and HEIs. Similarly, the impact of emerging technologies on learning (e.g., artificial intelligence) and their potential effects on RT and TS should be explored further. Future research could aim to replicate this study using more direct and objective measures of the theoretical constructs. Additionally, the proposed model could be tested in developed countries or from the perspective of teachers. Future studies might also consider different educational levels (e.g., master's and doctoral programs) and a broader range of disciplines (e.g., engineering, economics, medicine).

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#### COMPROMISO ESTUDIANTIL EN INSTITUCIONES DE EDUCACIÓN SUPERIOR: LA INFLUENCIA DEL ESTILO DE ENSEÑANZA, USO DE REDES SOCIALES Y ROL DEL DOCENTE

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#### RESUMEN

El objetivo de esta investigación fue desarrollar y validar un modelo para integrar las variables que influyen en el Compromiso Estudiantil (CE) en las Instituciones de Educación Superior (IES). Se empleó el método PLS-SEM para evaluar un modelo jerárquico reflexivo-formativo de CE. Los indicadores reflexivos fueron utilizados para medir los constructos de orden inferior, mientras que el constructo de orden superior fue evaluado a través de tres subconstructos formativos: Estilos de Enseñanza (EE), Uso de Redes Sociales (URS) y Rol del Docente (RD). El modelo fue probado en un país en desarrollo (Perú) y se incluyó una variable de control para determinar si el modelo varía según las características de otros dos países (Chile y Colombia). El RD mostró un impacto positivo y significativo en los niveles de CE, al igual que los EE y el URS. La variable de control demostró que el compromiso estudiantil puede variar dependiendo de las condiciones macroeconómicas, las metodologías de enseñanza y los recursos disponibles en las instituciones educativas de cada país. Estos hallazgos proporcionan información relevante para los responsables de las políticas educativas, docentes y administradores universitarios en los países estudiados.

#### ENGAJAMENTO ESTUDANTIL EM INSTITUIÇÕES DE ENSINO SUPERIOR: A INFLUÊNCIA DO ESTILO DE ENSINO, USO DE MÍDIAS SOCIAIS E PAPEL DO PROFESSOR

Winston Castañeda Vargas e Jaime Rivera Camino

#### RESUMO

O objetivo desta pesquisa foi desenvolver e validar um modelo para integrar as variáveis que influenciam o Engajamento Estudantil (EE) em Instituições de Ensino Superior (IES). O método PLS-SEM foi utilizado para avaliar um modelo hierárquico reflexivo-formativo de EE. Os indicadores reflexivos foram empregados para medir os construtos de ordem inferior, enquanto o construto de ordem superior foi avaliado por meio de três subconstrutos formativos: Estilos de Ensino (EE), Uso de Mídias Sociais (UMS) e Papel do Professor (PP). O modelo foi testado em um país em desenvolvimento (Peru), e uma variável de controle foi incluída para determinar se o modelo varia de acordo com as características de dois outros países (Chile e Colômbia). O PP apresentou um impacto positivo e significativo nos níveis de EE, assim como o EE e o UMS. A variável de controle demonstrou que o engajamento estudantil pode variar dependendo das condições macroeconômicas, metodologias de ensino e recursos disponíveis nas instituições educacionais de cada país. Esses achados oferecem informações relevantes para formuladores de políticas educacionais, professores e gestores universitários nos países investigados.