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Online Learning Engagement and its Influence on English Academic Outcomes: An Empirical Study of College Students in a Blended Learning Context

Yijia Jiang[1], Latha Ravindran[2*], Kam-Fong Lee[3]

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ABSTRACT

Purpose: In the era of digitalized education, blended learning, combining online and offline methods, is prevalent in college English instruction. While engagement is crucial for academic success, online learners often lack autonomy and efficiency. This study investigates the correlation between online engagement and English academic achievement in a blended learning context, emphasizing cognitive engagement. Strategies for enhancing online efficacy, including improved digital literacy and regular performance assessments, were explored. **Method:** Using a mixed-method approach with 190 college students, results showed moderate online engagement, with behavioural engagement surpassing cognitive and emotional dimensions. **Findings:** The study suggests the need for comprehensive training, timely feedback, and enriched online content for optimal learning experiences. **Implications for Research and Practice:** Collaborative evaluations between educators and students are emphasized to optimize online learning outcomes.

[1] PhD Candidate, Faculty of Social Sciences and Liberal Arts, UCSI University, Kuala Lumpur, Malaysia, 56000. ORCID iD: https://orcid.org/0009-0009-0451-0204, Email: 1002058881@ucsiuniversity.edu.my
[2] Senior Lecturer, Faculty of Education, Languages, Psychology and Music, SEGi University, Kuala Lumpur, Malaysia, 47810. ORCID iD: https://orcid.org/0000-0002-5830-2437, Email: latharavindran@segi.edu.my
[3] Senior Lecturer, Faculty of Education, Languages, Psychology and Music, SEGi University, Kuala Lumpur, Malaysia, 47810.ORCID iD: https://orcid.org/0000-0002-5572-8627, Email: mtvchris1002@gmail.com
* Correspondence: latharavindran@segi.edu.my

Introduction

In the contemporary global context, the dominance of English as the global lingua franca remains unchallenged, a status expected to persist in the foreseeable future (Wang, 2006). Within academic institutions, College English courses serve not only as instrumental tools but also as conduits for cultural enrichment (Zhang, 2017). Proficiency in English is paramount for university graduates as they aspire to contribute to an increasingly globalized economy, providing them with a competitive advantage in international arenas. Academic performance is influenced by a multitude of factors, encompassing both cognitive and non-cognitive dimensions. While cognitive abilities play a role in navigating entrance examinations, it is evident that academic trajectories are not solely dictated by cognitive factors. Non-cognitive elements, including learning anxiety, motivation, and engagement, have been recognized as pivotal determinants of academic outcomes (Jiang, 2019). Learning engagement, characterized by proactive and fulfilling cognitive states, is integral to the educational process. In the realm of online education, engagement serves a dual purpose: it serves as a gauge of students' immersion in the digital learning process and acts as a linchpin in ensuring the quality of online instruction. Given its centrality, scholarly investigations into online learning engagement have been extensive, delving into its determinants and metrics (Li et al., 2016) and its manifestations across diverse educational contexts. However, empirical studies correlating online engagement with English proficiency, particularly in the context of colleges, remain limited.

Simultaneously, the advent of information technology has instigated a paradigm shift in educational methodologies. Blended learning, integrating online and offline instructional approaches, has emerged as a pivotal component of contemporary pedagogy (Jia, Zhao, & Li, 2019). Within this hybrid model, learners gain access to a diverse array of study materials, resources, and flexible learning structures that are distinctive to online education. Despite the challenges associated with the transition to digital platforms, the benefits are substantial. Online learners engaged in virtual education may encounter issues such as diminished motivation, structural impediments, the digital skills gap, and a lack of interpersonal interaction. Ultimately, these challenges contribute to a decline in their participation in interactive course elements (Liu, Zhang, & Liu, 2017). Presently, researchers are particularly interested in the limited responsiveness, particularly among young learners. The three-dimensional facets of engagement—behavioural, cognitive, and emotional—are exceptionally crucial in the realm of online English language education; the distinctiveness of each dimension facilitates more effective validation of student performance. Each dimension assumes a unique role in shaping the learning experience and outcomes (Fredricks, Blumenfeld, & Paris, 2004).

Extensive discussions on online learning engagement have explored various aspects, including learner-teacher relationships, curriculum design, and technological support. However, these discussions often lack specificity, particularly in the context of English language learning. The dynamics of learner-teacher interactions extend beyond frequency to encompass the quality of linguistic and cultural exchanges crucial for language learning (Peng, 2021). In language teaching, the curricular development process uniquely emphasizes the integration of language skills with critical thinking and cultural awareness (Wang, 2011). Technological support in English language courses not only shapes the overall learning mode but also offers avenues for the development and enhancement of

language skills such as listening, speaking, reading, and writing.

Despite extensive discussions on the dynamic aspects of online learning engagement, the association between the extent of involvement in online learning and academic performance remains an inadequately explored area. Indeed, there is a notable scarcity of empirical research studies examining this facet within the domain of English language learning. Addressing this gap constitutes the primary objective of the present study, which delves into the interactive dynamics among the three dimensions of online learning engagement—behavioural, cognitive, and emotional—and their repercussions on academic performance (Wang et al., 2023). Consequently, this research endeavours to rectify the deficiency in empirical data by expanding upon theoretical discourse, offering insights that transcend theoretical discussions, and presenting implications for both practical applications and pedagogical theories.

Through elucidating the precise correlation between online engagement and achievements in English learning, this research aims to furnish educators with practical guidelines and strategies for instructional design, aiming to enhance student participation. Simultaneously, students are afforded the chance to gain deeper insights into their learning dynamics, facilitating the improvement of their strategies and the optimization of their experiences in online learning. In order to delve into the present learning experiences related to students' online engagement in English learning and its association with English academic achievement, the research formulates the following research questions.

1. What is the extent of the correlation between quantified engagement in online English learning and English achievements among college students?
2. What is the existing status of online learning engagement among college students in educational environments?

Literature Review

Learning Engagement

The origin of the term "engagement" can be traced back to the realm of employment. As articulated by Seligman and Csikszentmihalyi (2014), employee engagement encompasses a "positive behavioural disposition" within the workplace, leading to positive outcomes. This metric assesses an employee's enthusiasm and commitment to their professional responsibilities. Building upon this, Schaufeli et al. (2002) extended the concept to the field of education, defining learning engagement as an individual's eagerness for learning, marked by active participation and steadfast dedication.

Schlechty (2001) outlined a hierarchical framework comprising five tiers of student engagement, delineating varying levels of involvement during instructional sessions. Various scholars have offered diverse interpretations of learning engagement, focusing on different aspects of students' participation in the learning process. For instance, Li & Ren's (2013) research on the concept of commitment involves categorizing engagement into three distinct dimensions: behavioural, cognitive, and emotional. According to Han (2014), this classification manifests as a blend of acquired behaviours, emotional resonance, and cognitive strategy deployment. Both scholars present the triads of behavioural, cognitive, and emotional engagement in an enriching manner. Qiao (2006) examined this argument

by shedding light on the intensity of behavioural participation and the qualitative richness of emotional experiences apparent during learning, incorporating an intensity factor into both behavioural and emotional engagement elements.

In an equally significant perspective, Wu and Zhang (2018) offer a comprehensive view, conceptualizing learning engagement as a dynamic expression of learners' energy, adaptability, and positive affective states. Tang (2018) similarly contends that learning engagement involves the interplay of emotions and efforts throughout the learning journey, enhancing comprehension of the intricate nature of learning engagement. In light of these perspectives, learning engagement not only denotes time and effort invested in learning but also entails profound integration into the entire learning process. This integrated approach serves as a highly effective means of representing emotional resonance and personal experiences during the learning journey. The consensus among theorists on learning engagement is a tripartite structure, encompassing behavioural, cognitive, and emotional dimensions.

Online Learning Engagement

The rapid advancement of information technology has precipitated significant transformations in the educational landscape. This shift entails a departure from traditional lecture models towards a more dynamic pedagogical approach that fosters substantial collaboration between educators and learners. Concurrently, the exponential growth in online learning patterns has prompted the emergence of academic discourse dedicated to exploring issues pertaining to online learning engagement.

In a similar vein, online learning engagement, as conceptualized by both Fredricks et al. (2004) and Kuang et al. (2019), entails the active involvement of learners in online activities, reflecting in behavioural, cognitive, and emotional dimensions. Diverging slightly, Yin and Xu (2017) assert that such engagement predominantly manifests in two domains: online interaction and multifaceted online learning experiences within the online learning environment, encompassing perception, self-regulation, and emotional sustenance. Moreover, Liu et al. (2017) defines online engagement as a positive orientation where learners act based on interactivity and positive emotional experiences. The engagement theory comprises the triad of three facets: behavioural, emotional, and cognitive engagement. Building upon this concept, scholars extend the framework, proposing online learning engagement as a holistic amalgamation of somatosensory, cognitive, behavioural, emotional, and social interactions in the online learning milieu. These scholarly perspectives reveal variations in the intricacies of their academic viewpoints regarding online learner engagement.

Constructing Elements of Online Learning Engagement

Upon the inception of the 'learning engagement' construct, scholarly efforts shifted towards the formulation of measurement instruments. Gresalfi and Barab (2011) categorized learning engagement into four facets: procedural, conceptual, consequential, and critical. These facets underscore proficiency, comprehension, application, and critique, respectively. Adopting a psychological perspective, Christenson, Reschly, and Wylie (2012) asserted that online learning engagement comprises behavioural, cognitive, and emotional dimensions. This encompasses aspects such as attention, effort, persistence, strategic approaches, and affective reactions.

Zhu (2014) investigated factors influencing college students' engagement in learning, considering behavioural, emotional, and cognitive dimensions. Behavioural engagement involved students' effort, emotional engagement focused on affective responses, and cognitive engagement related to self-perceptions. Similarly, Fang and Liu (2018) explored factors influencing online learning participation, defining behavioural engagement as learner-teacher interactions, cognitive engagement as intellectual immersion, and emotional engagement as affective experiences like interest or a sense of belonging. Huang, Li, and Ren (2018) utilized community theory, categorizing involvement into cognitive, emotional, and behavioural dimensions, emphasizing tactics, affective experiences, and the investment of time and energy.

Online Learning Engagement and Academic Achievement

Student engagement research traces its roots back to Ralph Tyler's seminal study examining the connection between instructional time and learning outcomes over seven decades ago (Axelson & Flick, 2010). Since that foundational work, the academic discourse on student engagement has evolved significantly in both depth and breadth.

In the contemporary digital era, with the transformation of learning paradigms, scholars have increasingly shifted their attention to the relationship between online learning engagement and academic outcomes. Coates (2005) directly and indirectly linked student engagement to enhanced learning outcomes, while Ruey (2010) correlated course engagement levels with targeted learning outcomes and course interactivity. Experimental studies, including Zhang Youhong's (2017) survey, identified a positive association between online engagement and English academic achievement. Dunn and Kennedy (2019) found in their study that various strands of engagement predict academic grades. Lai et al. (2019) explored the impact of learning communities on student achievement and engagement, observing increased engagement levels when students were committed to online learning communities.

Subsequent investigations conducted by scholars, including Li (2021) and Yan (2020), consistently indicate a positive correlation between online engagement and academic outcomes in the context of English language studies. However, a noticeable gap exists in the literature regarding the status of the relationship between online learning engagement and English academic achievement among university college students. The present study aims to address this gap by exploring the correlation between online learning engagement and English academic performance within this particular cohort.

Methodology

The study employed a mixed-method design, integrating both quantitative and qualitative approaches to thoroughly investigate the research questions. For the quantitative aspect, a modified and validated version of Yang's (2020) Online Learning Engagement Measurement Scale (OLEMS) was utilized, focusing on behavioural, cognitive, and emotional engagement dimensions. English academic achievement was gauged using final examination scores from the college English course, including both oral and written components. The quantitative data underwent analysis using SPSS 25.0, employing descriptive statistics, Pearson correlation, and multiple linear regression analyses to explore relationships among key variables and assess the scale's reliability and validity.

Qualitative data collection involved conducting semi-structured interviews with a subset of students and teachers. This approach aimed to extract more profound insights into the nature of students' online learning experiences and teachers' pedagogical perspectives on online English learning. These qualitative findings served to complement the quantitative data, contributing to a more nuanced and comprehensive understanding of the studied phenomenon.

The integration of both quantitative and qualitative methods facilitated a deeper and intricate exploration of the relationships between online learning engagement and English academic achievement. This combined approach aimed to bridge existing gaps, yielding comprehensive findings that strengthen the overall outcomes of the study. The use of a mixed research method ensured the robustness and comprehensiveness of the study's findings.

Participants

This study enlisted 190 first-year college students from G University who had received a minimum of nine years of English education and were acclimating to the university's blended learning model. The cohort comprised 161 male students (84.74%) and 29 female students (15.26%), representing both urban (26.32%) and rural (73.68%) backgrounds. The diverse demographic profile aimed to ensure a representative cross-section of the student population, spanning 10 different disciplines that collectively represented a broad spectrum of academic backgrounds. Despite their varying majors, all participants shared a common experience in their first year: enrolment in the Public English course, a mandatory unit encompassing diverse foundational English language skills. In their initial year, they underwent 48 hours of classroom learning, including 5 hours dedicated to reading, writing, listening, and speaking activities.

Moreover, students engage in over 40 hours of online learning, underscoring the crucial role of online platforms in their language learning. The study focused on individuals actively involved in daily online learning, encompassing tasks assigned by teachers and self-directed activities. This dimension provided a unique opportunity to evaluate the intricacies of online learning engagement in authentic real-world conditions. The distinct characteristics of both traditional and virtual classrooms, with extensive exposure, facilitated an exploration of the nuances of online learning engagement and its subsequent impact on English academic performance.

The study selected 190 participants based on inclusion criteria crucial for assessing the issue. The choice of this sample size aimed at ensuring accuracy, reliability, and validity for quantitative analysis. This scale covered a diverse range of experiences and perspectives on online education and English learning, facilitating effective data collection and analysis. The selection of 190 participants aimed to strike a balance between breadth and depth of data, allowing a comprehensive view of student engagement across various demographics. This balance was essential for deriving meaningful conclusions from the research. In addition to the questionnaire, the study included a small group of students and four college English teachers for in-depth interviews.

The study benefited from four experienced faculty members dedicated to English teaching, providing a comprehensive understanding of student collaboration in online learning. These interviews aimed to offer qualitative insights complementing quantitative

data, enriching perspectives on online learning from both students and mentors. The findings, paralleling G University with other regional institutes, enhance generalizability within G Province. The researcher's role as an English teacher at the university ensured first-hand, credible insights, reinforcing the study's credibility.

Research Instruments

Online Learning Engagement Measurement Scale

In this study, the operationalization of online learning engagement encompassed three distinct dimensions: behavioural engagement, cognitive engagement, and emotional engagement, integral to the students' participation in STEAM activities. Aligning with the literature review and the unique context of the study, the Online Learning Engagement Scale (OLES), developed by Yang (2020), served as the surveying instrument for evaluating these dimensions. The scale, previously validated in other studies, underwent revisions to align with the specific goals of this research. Prior adjustments were made to ensure the questionnaire's suitability for the research context and its relevance to the study. Subsequently, the instrument underwent critical reviews by fellow faculty members and students from the College of Languages, Literature, and Communications to ensure its content's pertinence.

The questionnaire comprised two sections: online surveys and interviews. The initial segment gathered students' basic demographic information. The second part, consisting of 17 points, assessed college students' online learning participation. Specifically, items 6–10 focused on behavioural engagement, items 11–16 addressed issues of cognitive engagement, and items 17–22 explored emotional engagement. A Likert five-point scale was employed, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with options structured as follows: 1 for Strongly Disagree, 2 for Disagree, 3 for Neither – Agree nor Disagree, 4 for Agree, and 5 for Strongly Agree. Higher scores indicated increased engagement in online learning. This approach was chosen to capture the nuanced nature of student engagement across the three distinct dimensions identified in this study.

English Academic Achievement Measurement

In this study, students' English academic achievement relied on their college English final examination scores, which encompassed both oral and written components. The written test evaluated various language skills, including reading, listening, translation, and writing, to gauge participants' overall English-speaking competency. Assessment questions were sourced from the Shanghai Foreign Language Education Press testing material pool to ensure objectivity and scientific rigor in the evaluation process. The test, comprising 55 multiple-choice questions, a paragraph translation, and a writing activity, achieved a balanced blend of objectivity and subjectivity.

The test's scoring distribution entailed 65% for objective questions, 25% for subjective questions, and 10% for the oral English component. The comprehensive range of tests aimed to assess students' English skills across a spectrum from basic to advanced mastery levels. The exam utilized a step-wise difficulty scoring system, allocating 50% to assess basic language skills, with 30% rated as moderately difficult, reflecting proficiency at the grade level, and 20% considered more challenging, assessing advanced language proficiency. This

design ensured the exam measured students' English proficiency comprehensively, covering areas such as listening, vocabulary, and grammar. The examination targeted proficiency in the four main facets of English grammar: listening, reading, writing, and speaking.

Semi-Structured Interviews

To complement the quantitative data, this study conducted semi-structured interviews with a cohort of students and teachers involved in the intervention. By presenting these testimonies, a more comprehensive and detailed depiction of how college students engage in online English learning was generated. The validation process ensured that the questions were contextually relevant and achievable. I actively participated in the development of the interview questions, which underwent validation. Utilizing English language teaching experts and education research specialists, the questions were reviewed for clarity, relevance, and their capacity to elicit detailed answers that could potentially reflect unique experiences related to online learning (Sánchez-Guardiola Paredes, Aguaded Ramírez, & Rodríguez-Sabiote, 2021).

Indeed, a pilot study was conducted involving both students and teachers not included in the main study. Feedback from the pilot study was instrumental in refining the clarity and precision of the questions, ensuring their alignment with the research objectives (Majid et al., 2017). This served as a preparatory phase to assess the effectiveness of the research tools employed. Valuable input from participants in the pilot study contributed to enhancing the validity of the questionnaires. The iterative process of editing questions instilled confidence that they were not only comprehensible but also aligned with the research objectives, thereby enhancing the overall precision and robustness of the study outcomes.

The insights provided by both student and teacher contributions were integral for a comprehensive understanding of the online learning environment. This study gleaned significant observations regarding students' experiences through an in-depth analysis of their feedback. Incorporating teachers' perspectives allows for a holistic appreciation of potential pedagogical challenges and viable solutions within the realm of online learning. Employing a mixed-method approach that combines quantitative and qualitative data enhances the breadth and depth of the research, facilitating more comprehensive conclusions. This systematic method contributes significantly to expanding the knowledge base concerning the extent of engagement in online learning and its ramifications on academic performance, particularly within the domain of English. It markedly advances a nuanced understanding of the impact of online learning participation on English academic achievement.

Data Collection Procedures

Administration of Questionnaire

Following the final examination, the survey was distributed to students using the "Wenjuanxing" platform. Prior to participation, students were briefed on the study's objectives. It is crucial to highlight that participants were informed about their rights, potential risks, and the protective measures implemented to ensure the confidentiality and anonymity of the provided information (Malmqvist et al., 2019). Informed consent was obtained after presenting participants with a clear description of the study's objectives

(Minei et al., 2020). Despite expecting 202 completed questionnaires, a total of 190 responses were received, resulting in a commendable 94% response rate.

Data Analysis Procedure

The data for analysis underwent processing using Statistical Package for the Social Sciences (SPSS) Version 25.0. Initially, descriptive statistics were conducted to examine samples and main variables as part of the preliminary analysis. Subsequently, the scale's validity and reliability were assessed using the Cronbach Alpha coefficient and the KMO and Bartlett test, respectively. Following this, data analysis was carried out using Pearson correlation and multiple linear regression methods to investigate the relationships between online learning engagement variables and students' English academic achievement.

Reliability Analysis

Reliability, indicative of the consistency and dependability of the gathered dataset, constitutes a fundamental aspect of any research endeavour. It assesses the internal consistency resulting from multiple measurements on a specific subject within the research domain, designed primarily for data extraction (Revelle & Condon, 2019). Ensuring the robustness of reliability stands as an initial research step, followed by the subsequent confirmation of the authenticity of the research outcomes. In this study, the validity of the scale was assessed using Cronbach's Alpha, the most commonly employed measure for reliability (McNeish, 2018). The Cronbach's Alpha coefficient value in our study is presented with objectives (Bujang, Omar, & Baharum, 2018). Coefficients falling within the range of 0.6 to 0.7 are considered adequate to ensure reliability. A range of 0.7–0.8 indicates a commendable level of reliability. Overall, coefficients exceeding 0.8 are indicative of exceptional predictive reliability. A coefficient below 0.6 signals that the scale lacks reliability, necessitating resolution through scale revision.

Table 1presents the internal consistency of the latent variables of the learning engagement scale through reliability coefficients. Specifically, the Cronbach's Alpha scores for behavioural engagement, cognitive engagement, and emotional engagement are 0.633, 0.868, and 0.747, respectively. Given that all coefficients surpass the 0.6 threshold, it can be inferred that each dimension is appropriately labelled and exhibits a high level of reliability. Therefore, the learning engagement scale demonstrates satisfactory reliability for the purposes of this research.

Table 1

Reliability Analysis Results

Variable	Items	Cronbach's Alpha
Behavioural engagement	5	0.633
Cognitive engagement	6	0.868
Emotional engagement	6	0.747

Validity Analysis

The content validity, assessing the comprehensiveness of a test in evaluating all facets of the construct under examination, is a critical criterion. For findings to be deemed valid, the

instrument must encompass all essential aspects of the measured value. The content validity of the learning engagement scale was determined through a literature review, followed by the selection of a pre-established scale aligned with it. Modifications were made based on previous experience, valid theories, and input from educators and students at the School of Foreign Studies. With these methodological refinements and adjustments, the scale is asserted to possess optimal content validity.

Introducing another term, structural validity pertains to the alignment between empirical measurements and theoretical constructs. It signifies the concordance between portrayed relationships through measurement outcomes and established theoretical knowledge (Jacobs & Krueger, 2015). In this study, to scrutinize the structural validity of the Learning Engagement Scale, the KMO measure and Bartlett test of sphericity were employed. The detailed outcomes of this assessment are presented in Table 4.

Table 2

KMO and Bartlett's Test of Learning Engagement

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.862**
Bartlett's Test of Sphericity	Approx. Chi-Square	1,163.442
	df	136
	Sig.	.000

Given that Table 2 yields a KMO value of 0.862, the adequacy of sampling meets the criteria. Furthermore, Bartlett's Test of Sphericity yields a Chi-square value of 1163.442 with 136 degrees of freedom and a significant p-value ($p < 0.05$). These outcomes collectively affirm the scale's satisfactory structural validity.

Results and Discussion

Descriptive Analysis for Participants Demographics

Table 3

Demographic Information of The Participants

Demographic	**Category**	**Frequency**	**Percentage**
Age	19	60	31.57
	20	50	26.31
	21	30	15.78
	22	20	10.52
	23	10	5.26
	24	10	5.26
	25	10	5.26
Gender	Male	161	84.74
	Female	29	15.26
Academic Level	Bachelor	140	73.68
	Master	40	21.05
	PhD	10	5.26

This study enlisted a heterogeneous sample of 190 participants, with ages ranging from 19 to 25 and a mean age of 22 years. All participants were students enrolled at G University in China. The gender distribution mirrored the population, comprising [84.74%] male and [15.26%] female participants as shown in Table 3. The academic levels of the participants spanned from a bachelor's degree to a PhD degree.

Descriptive Statistical for the Variables

To examine the present status of online learning engagement among non-English students, this study employed the mean value in descriptive statistical analysis to portray the levels of online learning engagement. (Here, items BE refer to Behavioural Engagement, CE refers to Cognitive Engagement, and EE refers to Emotional Engagement as per the questionnaire.).

Table 4

Descriptive Statistical Information of The Variables

Items	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
BE1	190	1	5	3.62	0.950	-0.334	-0.144
BE2	190	2	5	3.69	0.832	-0.033	-0.635
BE3	190	2	5	3.43	0.743	0.529	-0.091
BE4	190	2	5	3.42	0.750	0.349	-0.173
BE5	190	1	5	3.82	1.145	-0.839	-0.187
CE1	190	1	5	2.86	0.837	0.372	0.149
CE2	190	1	5	3.16	0.883	0.152	-0.479
CE3	190	2	5	3.24	0.837	0.187	-0.570
CE4	190	1	5	3.27	0.846	-0.014	-0.541
CE5	190	1	5	3.11	0.842	0.336	-0.270
CE6	190	1	5	3.15	0.850	0.068	-0.192
EE1	190	1	5	3.21	0.946	-0.118	-0.061
EE2	190	1	5	3.32	0.787	-0.163	0.011
EE3	190	1	5	3.45	0.946	-0.321	-0.155
EE4	190	1	5	3.49	0.802	-0.263	0.181
EE5	190	1	5	3.11	0.844	0.267	0.112
EE6	190	2	5	3.26	0.745	0.152	-0.259

Table 4 furnishes a comprehensive statistical analysis of each questionnaire item, encompassing metrics such as the participant count, minimum and maximum values, mean, standard deviation, skewness, and kurtosis. These statistics play a pivotal role in assessing the normality of survey data, a critical factor influencing subsequent analyses. According to Kline (1998), a dataset approximates a normal distribution if the absolute values of skewness and kurtosis are less than 3 and 10, respectively. As indicated in Table 4, all items meet these criteria. Notably, the absolute skewness values for each item are below 3, and their kurtosis absolute values remain within the acceptable threshold of 10. This affirms the normal distribution of the data, rendering it suitable for further reliability and validity assessments.

Table 5

Mean And Total Score of The Variables

Variables	Items	Mean	Total score
English academic achievement	1	67.60±8.33	-
Learning engagement	17	3.33±0.48	56.6±8.19
Behavioural Engagement	5	3.60±0.57	17.98±2.85
Cognitive Engagement	6	3.13±0.66	18.78±3.96
Emotional Engagement	6	3.31±0.56	19.84±3.38

Table 5 delineates the comprehensive engagement of university students in English online learning, reflecting a mean score of 3.33, indicative of a moderate level of engagement. This implies that, on average, university students demonstrate a moderate degree of involvement in their online English learning pursuits. A detailed examination of the engagement dimensions illustrates mean scores of 3.60 for behavioural engagement, situating it at a higher-middle level. In contrast, cognitive engagement records a mean score of 3.13, signifying a moderate level. Similarly, emotional engagement, with an average score of 3.31, aligns with the moderate spectrum. Notably, students exhibit the highest level of engagement behaviourally, with cognitive engagement being the least emphasized.

Twenty interviews were conducted to gain insights into student engagement. It was found that four students lacked structured study plans, reflecting low cognitive engagement. Initial engagement was often driven by necessity rather than genuine interest. However, over time, students increased their engagement, establishing study routines and showcasing commendable transformation in online learning habits by the semester's end.

In response to challenges, these students exhibited proactive measures by actively seeking and implementing solutions, ensuring a continuous and resilient online learning experience. A considerable portion of the student population demonstrated enthusiasm, particularly evident in their positive reception and active engagement with digital assessments, such as online tests. This keen interest underscores their openness to incorporating technology-enhanced learning components within the academic milieu.

Correlation Analysis of Learning Engagement and English Academic Achievement

Table 6

Pearson Correlation Coefficients of The Variables

	Behavioural Engagement	Cognitive Engagement	Emotional Engagement	English Academic Achievement
Behavioural engagement	1			
Cognitive engagement	.417**	1		
Emotional engagement	.377**	.566**	1	
English academic achievement	.535**	.660**	.542**	1
Mean	67.601	3.596	3.131	3.306
Std. Deviation	8.333	0.571	0.660	0.564

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation analysis functions as a statistical method to determine the existence and extent of associations between two variables. More precisely, linear correlation analysis examines the strength of a linear relationship between paired sets of variables. The correlation coefficient, a pivotal metric in statistical assessments, quantitatively expresses the extent of linear association between variables (Gogtay & Thatte, 2017). Accordingly, this research utilizes the Pearson correlation coefficient to evaluate relationships between variables.

Table 6 presents the correlation coefficients among the variables. Importantly, all coefficients fall below the 0.7 threshold, indicating the absence of multicollinearity. The coefficients for behavioural engagement, cognitive engagement, and emotional engagement concerning English academic achievement are 0.535, 0.660, and 0.542, respectively. This underscores a significant positive relationship between these facets of online learning engagement and English academic achievement. Notably, the correlation between cognitive engagement and English academic achievement emerges as the most pronounced, while the association with behavioural engagement is comparatively subdued. These nuanced distinctions emphasize the varied impact that different engagement dimensions may exert on academic achievement in the context of English learning.

Regression Analysis of Learning Engagement on Academic Achievement

Regression analysis, a statistical methodology employed to explore the connection between a dependent variable and one or more independent variables, aims to discern the impact exerted by independent factors on the dependent variable. In this context, to elucidate the influence of behavioural, cognitive, and emotional engagement on academic efficiency, a multiple linear regression analysis was employed. This technique, rooted in simple linear regression principles, examines relationships between a single dependent variable and multiple independent covariates (Pandis, 2016). In this study, behavioural, cognitive, and emotional engagements were designated as independent variables, while academic performance was considered the dependent variable.

Table 7

Regression Analysis Results

	Unstandardized Coefficients		**Standardized Coefficients**	***t***	**Sig.**	**Collinearity Statistics**	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	26.351	3.077		8.565	0.000		
Behavioural engagement	4.112	0.813	0.282	5.059	0.000	0.797	1.255
Cognitive engagement	5.499	0.790	0.435	6.958	0.000	0.631	1.584
Emotional engagement	2.797	0.907	0.189	3.084	0.002	0.656	1.525

$R=0.735$, $R^2=0.541$; $F=72.932$, $P=0.000$

Dependent Variable: English academic achievement

Additionally, Table 7 illustrates that the coefficient of determination (R^2) is 0.541,

indicating that the independent variables elucidate 54.1% of the variance in the dependent variable. The F-test serves as a comprehensive tool for evaluating the regression model, assessing the significance of observed effects (Sureiman & Mangera, 2020). With a calculated F-value of 72.932, statistically significant at the 0.05 level, it underscores the robust linear relationship between the dependent and independent variables in the model. Moreover, the multicollinearity diagnostics reveal that all Variance Inflation Factor (VIF) values are below the threshold of 5, and tolerances surpass the benchmark of 1, affirming the absence of multicollinearity concerns.

The standardized regression coefficient for behavioural engagement is 0.282 (t=5.059, P=0.000<0.001), signifying a substantial positive influence on academic achievement. Similarly, the standardized regression coefficient for cognitive engagement is 0.435 (t=6.958, P=0.000<0.001), indicating a significant positive impact on academic achievement. Emotional engagement also demonstrates a noteworthy positive impact, with a standardized regression coefficient of 0.189 (t=3.084, P=0.002<0.01). Collectively, the three dimensions—behavioural, cognitive, and emotional engagement—display statistically significant and positive effects on English academic achievement. These findings provide valuable insights into the distinct contributions of each engagement dimension to students' overall English academic performance.

Interview Data Analysis

To enrich the qualitative analysis of the research, incorporation of detailed excerpts from interviews can fortify the quantitative results. The semi-structured interviews conducted with both students and teachers offered profound insights into the intricacies of online English learning for college students, serving as a complement to the quantitative dataset. The student interviews unveiled several themes. Regarding Behavioural Engagement, numerous students conveyed challenges in sustaining focus and motivation within an online environment, aligning with the quantitative analysis outcomes that underscored difficulties in behavioural and emotional engagement. This sentiment was articulated by participants P1 and P4, mirroring the identified challenges.

"Online and platform learning can easily distract me and sometimes I feel less motivated to actively participate in activities." (S1)

"The digital landscape is rife with distractions. With just a click, I can find myself tumbling down the rabbit hole of social media or caught up in the latest news cycle, side-lining my learning goals." (S4)

This corresponds to the lower scores in behavioural engagement noted in the survey. Students often mentioned challenges like low motivation, distractions at home, and struggles with comprehending complex concepts in the absence of face-to-face interaction. This aligns with existing literature highlighting the difficulties of sustaining engagement in a virtual learning setting (Jiang, 2019).

In contrast to the literature discussed earlier, some students noted that online learning environments enhanced their engagement. They attributed this to the less intimidating nature and the anonymity provided by digital platforms. This suggests a nuanced understanding of behavioural involvement in online contexts. For instance, students S5

and S7 shared their viewpoints on this matter.

"I've found myself way more engaged in online learning environments than I initially expected. On these digital platforms, I don't have to worry about the embarrassment of speaking in front of everyone, which makes me feel more comfortable and secure..……" (S5)

"I can focus more on sharing my thoughts and learning. This level of anonymity gives me a kind of freedom to express myself more confidently and even engage in discussions I might have avoided before." (S7)

Moreover, in response to inquiries about knowledge acquisition methods, students consistently highlighted the use of interactive tools and collaborative activities. This insight was expressed by students S9 and S10, respectively.

"Group discussions and interactive quizzes help me engage more with the material." (S9)

"Whether it's through online discussion boards, group projects, or virtual labs, being able to bounce ideas off my peers, challenge each other's thinking, and solve problems together really enhances my understanding of the material."(S10)

The inclination towards interactive methodologies is substantiated when examining the quantitative outcomes, revealing that students exhibited a moderate level of cognitive engagement. This correlation between preferences and engagement levels underscores the importance and efficacy of interactive approaches in fostering cognitive engagement among students.

Additionally, many students highlighted the adoption of self-regulated learning strategies, encompassing setting personal goals and utilizing online resources. This perspective was clearly conveyed through the remarks of students S12 and S14.

"Especially in the context of online education, It's about taking control of your determining what you want to achieve, and then methodically working towards those learning goals with the vast resources available online.." (S12)

"Focusing on my major's needs, I emphasized enhancing my practical abilities in English. I regularly browse international trade websites and read economic reports in English to get accustomed to the professional jargon. " (S14)

This discovery aligns with the quantitative findings indicating a positive correlation between cognitive engagement and academic achievement, consistent with studies by Zhang, Ma, and Cheng (2023). Intriguingly, some students expressed a preference for self-paced, lecture-based content, challenging the assumption of universal preference for interactivity. This indicates diverse cognitive engagement styles among online learners, as articulated by students S14 and S15.

"Participating in English-speaking clubs, engaging in debates, and utilizing language exchange platforms are activities that not only keep me engaged but also substantially enhance my linguistic skills. " (S14)

"I prefer structured, lecture-based content when learning English. I feel that such a

format provides a clear and comprehensive path through the complexities of grammar, vocabulary, and syntax." (S15)

Furthermore, interactive activities like online discussions and collaborative projects were emphasized as crucial elements in enhancing participation and enthusiasm. This viewpoint was expressed by several students, as exemplified in the following excerpt:

"These platforms allow me to engage in discussions on a wide range of topics, from grammar intricacies to cultural nuances within English-speaking countries. The interactive nature of these forums encourages me to actively use English in a real-world context,." (S14)

"Collaborative projects have been another avenue through which my enthusiasm for English has grown. I worked with a group of peers from various countries on a project exploring the impact of language on intercultural communication." (S15)

The quantitative finding reveals a positive impact of behavioural engagement on academic achievement, aligning with Hu and Xie's (2020) similar findings in online classrooms.

Educators emphasize the need for more engaging content and instructional approaches to enhance online learning. This is deemed crucial to stimulate student interest and engagement in acquiring subject knowledge within virtual learning environments. One instructor remarked,

"We need to integrate more multimedia and interactive elements to keep students engaged"." (T1)

"I've incorporated video lectures, podcasts, and interactive quizzes into my curriculum. These tools not only provide variety but also cater to different learning styles, making complex English language concepts more accessible and engaging for students." (T3)

This recommendation corresponds with the research findings underscoring the significance of cognitive engagement in online learning contexts. Educators recognized challenges such as restricted student-teacher interaction and variations in students' digital literacy levels. These challenges align with prior research identifying obstacles to achieving effective online learning (You, 2021).

The qualitative findings underscore the significance of emotional support in online learning. Students expressed a need for more empathetic communication from educators, as articulated by participant P16.

"Personalized feedback and encouragement from teachers really make a difference." (P16)

"Students expressed appreciation for the personalized guidance and encouragement, which they said helped them to feel more confident and invested in their work." (P18)

This corresponds with the quantitative results indicating the substantial impact of emotional engagement on academic achievement. Proposed measures encompass the incorporation of interactive multimedia resources, consistent feedback, and personalized learning trajectories, aligning with the multifaceted approach to engagement advocated by Zhang et al. (2023).

Conclusion

This study investigated college students' online engagement patterns, examining the complexities of their participation in online learning and exploring the link between their engagement levels in online activities and academic outcomes in English learning. Descriptive statistics revealed a moderate level of online learning engagement among college students, encompassing behavioural, cognitive, and emotional dimensions. Notably, behavioural engagement was predominant, while cognitive engagement lagged. Pearson's correlation demonstrated a consistently positive association between online engagement and academic achievement in English across all three dimensions. Surprisingly, cognitive engagement emerged as the most influential factor, contrasting with behavioural engagement, which exhibited the weakest association. These findings highlighted a positive correlation between online learning engagement and English proficiency among engineering graduate students, emphasizing the significance of the behavioural engagement domain.

Conversely, employing the multivariate regression method allowed a more in-depth exploration of the impact of engagement levels on English academic achievement. Each dimension demonstrated statistical significance, with cognitive engagement emerging as the most influential factor. A thorough examination of multiple regression analyses elucidates the combined effects of these engagement dimensions, shedding light on the intricate dynamics contributing to English academic achievement. This analysis elucidates the nuanced interplay that contributes to the attainment of success in English studies.

Limitations of the Study

While the current research provides valuable insights, it is essential to acknowledge potential limitations. Firstly, the sample size of 190 college students may impact the generalizability of the findings. Challenges in questionnaire distribution and data collection processes led to the utilization of a convenience sample. While expedient for the study, it raises concerns about the applicability of the results to a broader population. Notably, the study's outcomes are derived from students in a specific region, posing limitations in correlating or representing the experiences of students from diverse geographical backgrounds.

Moreover, a potential limitation lies in the reliance on a singular metric, the final examination results, to gauge students' mastery of English academic knowledge. Solely using this measure may present an incomplete representation of the overall scenario, as factors like individual differences, mood fluctuations, distractions, or fatigue could impact a student's performance in a single assessment. These variables, unrelated to language proficiency, underscore the need for a comprehensive evaluation that considers various influences on students' academic competence.

Considering the limitations of this study, future research in this field should employ a more inclusive sampling technique to encompass students from diverse regions. Additionally, utilizing a comprehensive metric that integrates continuous evaluations, incorporating class participation and diverse assessments, could provide a more holistic understanding of students' English academic skills.

Recommendations for Future Studies

Enhancement of Online Learning Engagement in English

The study underscores the significance of cognitive engagement in online English language learning and academic achievement. Despite suboptimal levels of cognitive engagement among college students, recommendations include strategic learning planning and skill enhancement. Developing an overall study plan to enhance learning efficiency, addressing weaknesses through courses or workshops, and adopting an integrative approach to learning are suggested. Creating connections with previous knowledge, ensuring retention, and using adaptive memorization strategies, such as optimal memory consolidation timing, are emphasized for effective language retention.

Self-assessment and methodological refinement are crucial components for effective learning. Learners are advised to regularly adjust their learning methods based on results to align with academic goals. Employing a variety of techniques, including examples, comparative analysis, and practice, enhances comprehension. Alongside these methods, students are encouraged to engage in imaginative and experimental exercises with acquired concepts to foster critical thinking and cognitive development. Implementing these recommended steps can significantly enhance college students' engagement and enjoyment in learning English online, ensuring a more enriching and effective language learning experience.

Augmentation of Online Learning Engagement

The pivotal role of college English teachers in shaping the digital academic landscape is evident, as they guide decision-making processes in digital English teaching. This study underscores the necessity for these educators to continually develop and refine their pedagogical approaches to meet the evolving requirements of digital English education. In the contemporary digital era, it is imperative for English teachers at the college level to remain cognizant of significant advancements in modern information technology. This not only involves upgrading their proficiency in recent digital tools designed for English teaching but also entails an adjustment of their teaching philosophies and methodologies. Modern academic theories advocate for a shift in perception and creative experimentation, urging instructors to embrace and explore new teaching methods and tools that enhance the overall online learning experience.

Feedback in English courses holds paramount significance, particularly in the timely provision of constructive remarks on assignments, essays, and reflective papers. This practice forms the core of the teacher-student relationship and is crucial for English language acquisition. Reflection on feedback unveils grammatical subtleties and content incongruities, offering valuable insights for students seeking to enhance their English perception and production. Given the diverse backgrounds and linguistic profiles of students, there is a pressing need for pedagogical interventions tailored to individual needs.

The diversity among English educators underscores the need for them to recognize and adapt their teaching strategies accordingly. Employing adaptive instructional strategies ensures alignment with individualized learning paths. Moreover, a comprehensive English

education approach can be achieved through the integration of mixed electronic and in-person learning environments. This includes designing activities that serve as platforms for blending the strengths of both digital and traditional learning. The integrated approach combines various learning modalities to provide students with a thorough mastery of English. In conclusion, implementing the advice offered by English instructors at colleges and universities can significantly enhance the quality and effectiveness of online instruction. This proactive approach not only fosters profound student engagement but also facilitates substantial improvements in language acquisition, creating a productive and revitalizing learning environment.

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