

College English Online Teaching during the Pandemic in China: A Perspective on Student Learning Engagement

A Doctoral Thesis Presented by

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Submitted in Partial Fulfilment for the Award of the Degree of Doctor of

English Language, Education and Literature

University of Wales Trinity Saint David

2026

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Dedication

I would like to dedicate my thesis to my dear grandparents and my beloved father and mother. Your unwavering love has been the foundation upon which I have built my life and aspirations. This thesis is not mine alone, but a reflection of the love, values and inspiration you have given me. May it honour your legacy and stand as a symbol of all that we have achieved together.

Acknowledgments

Finally, I am approaching the end of my doctoral journey at the University of Wales Trinity Saint David. Looking back, I have experienced my share of worries, hardships, struggles, doubts, perseverance, tears and smiles. Yet, as the saying goes, "I came, I saw, I conquered." This journey has instilled in me a deep confidence in my future.

First and foremost, I wish to express my profound gratitude to my esteemed university, UWTSD, for her kindness, tolerance, generosity and steadfast support, which gave me the opportunity to fulfil my dream. A new chapter of my life's journey begins here.

Second, I shall always cherish the selfless dedication of my teachers. I am especially indebted to my instructor, Jessica, whose insightful courses not only imparted invaluable knowledge but also sparked the inception of this thesis. Her guidance has been instrumental in shaping my academic path. My sincere thanks go to my supervisors, Geraldine and Gina, for their timely and crucial support. Their thoughtful advice and meticulous feedback were indispensable throughout the research process, helping me navigate its many complexities. I also extend my appreciation to Bettina for her excellent communication and coordination, which ensured the smooth progress of this project. Her organisational skills and keen attention to detail were of particular benefit.

Third, I am immensely thankful to my parents, who have been my unwavering source of strength, love and encouragement throughout every stage of this demanding journey. From the moment I embarked on my doctoral studies, they believed in my vision even when self-doubt clouded my own mind. Their constant reassurance reminded me that perseverance and integrity matter far more than immediate ease or comfort.

Fourth, I am grateful to my classmates for their readiness to share information and engage in stimulating discussions. Their collaborative spirit enriched my understanding and broadened my perspectives.

Lastly, I wish to thank the students who participated in my research. Their cooperation and the rich, detailed data they provided were essential to the success of this study.

A Chinese proverb states, "The fire burns high when everybody brings wood." I aspire to be someone who contributes (who "brings wood") to society and the world throughout my life.

Thank you all for your support and contributions.

Abstract

Driven by technological advances, rising global demand for English proficiency, and the accelerated shift to remote education during the COVID-19 pandemic, online College English learning has undergone rapid expansion. Paradoxically, this growth has coincided with widespread deficits in student engagement, characterized by diminished motivation, frequent distraction, limited interaction and superficial learning outcomes. Enhancing engagement is therefore a critical challenge in online College English instruction. While prior research has examined online learning broadly, a significant theoretical gap remains: the lack of a framework to explain engagement mechanisms within crisis-induced learning environments. This study addresses that gap by constructing an integrated model that elucidates the dynamic interaction between contextual factors and individual agency in shaping student learning engagement in pandemic-era College English online teaching.

Grounded in Educational Ecology Theory, with Social Cognitive Theory and Constructivism integrated as complementary theoretical lenses, the research employed a sequential explanatory mixed-methods design. A quantitative survey of College English students (stratified sampling) was followed by qualitative interviews with students and teachers (purposive sampling), enabling triangulation of perspectives on intrinsic and extrinsic engagement mechanisms.

Findings reveal a complex profile of online engagement among Chinese College English learners. Overall engagement was moderate ($M=3.45$), exhibiting a clear hierarchy: interactive engagement was highest, largely reinforced by teacher-led synchronous activities, while cognitive engagement, especially goal-setting and metacognitive strategy use, was weakest. Although all five support sources (self, teacher, peer, institutional and family) correlated positively with engagement, regression analysis indicated that student self-support was the strongest yet most fragile predictor, with institutional and family support also providing unique predictive value; teacher and peer support did not show significant independent effects. Reflexive thematic data analysis establishes that motivation, self-efficacy, and self-regulation act as the foundational intrinsic mechanisms. Viewed ecologically, the study uncovered both alignments and mismatches between

students' internal mechanisms and external support structures. The findings reveal that online engagement mechanisms exhibit a dual characteristic: external hierarchical weight shifts, marked by increased reliance on the microsystem and reduced mesosystem interaction, coupled with internal mechanism chain disruptions, namely metacognitive breakdowns that impair self-regulated learning.

Theoretically, this study offers three key contributions. First, it develops an integrated framework for understanding online student engagement in crisis contexts, adapting and synthesizing established theories to the specific ecology of College English learning. This framework identifies the core mechanism driving engagement, addressing a critical gap by revealing how external ecological conditions interact with internal cognitive and motivational processes. Second, it proposes a hierarchical structure among the four dimensions of engagement, clarifying their interrelationships. Third, it delineates the applicability boundaries of Bronfenbrenner's Ecological Systems Theory and Social Cognitive Theory within the context of online College English teaching, arguing that student engagement is ultimately mediated by the dynamic fit between multilayered external supports and the learner's intrinsic mechanism.

Practically, the study translates its findings into a multi-level strategy for fostering sustainable engagement in online College English instruction. The proposed approach emphasizes maintaining the dynamic equilibrium of the learning ecology by prioritizing students' self-support capacities, redefining teacher and peer support roles and strategically integrating institutional and family resources to build a cohesive, sustainable engagement ecosystem. Consequently, this research provides educators and administrators with actionable insights to enhance College English online teaching pedagogy, which is particularly relevant for designing resilient instruction in the post-pandemic era.

Key words: College English; Online Student Engagement; Educational Ecosystem; COVID-19 Pandemic

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Abbreviations

ANOVA	A one-way Analysis of Variance
AVE	Average Variance Extracted
CET	College English Teaching
CET-4	College English Test Band 4
CET-6	College English Test Band 6
CoI	Community of Inquiry
CR	Composite Reliability
D-W	Durbin - Watson
EFL	English as a Foreign Language
EFA	Exploratory Factor Analysis
ERT	Emergency Remote Teaching
FS	Family Support
HEIs	Higher Education Institutions
IS	Institutional Support
LMS	Learning Management System
MOOC	Massive Open Online Courses
NSSE	National Survey of Student Engagement
OLAE	Online Learning Affective Engagement
OLBE	Online Learning Behavioural Engagement
OLCE	Online Learning Cognitive Engagement
OLIE	Online Learning Interactive Engagement
OLTS	Online Learning Time Management
OSE	Online Student Engagement
PS	Peer Support
SCT	Social Cognitive Theory
RTA	Reflexive Thematic Analysis
SRL	Self - Regulated Learning
SS	Student Self - Support
TA	Thematic Analysis
TAM	Technology Acceptance Model
TS	Teacher Support
VIF	Variance Inflation Factor

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Appendix I The RTA Coding Process

Chapter 1 Introduction

The COVID-19 pandemic has been widely regarded as an unplanned, large-scale disruption that tested the capacity of educational systems to sustain student engagement during Emergency Remote Teaching (ERT). In the context of Chinese higher education, College English Teaching (CET), a compulsory subject for non-English majors oriented towards communicative competence, faced considerable instructional and engagement-related challenges. Although existing studies have examined online learning behaviours in general terms, relatively little attention has been paid to how crisis-driven shifts in the learning ecology affect the multidimensional nature of engagement within CET. Against this background, the present study seeks to examine the key influencing factors and mechanisms that shape online learning engagement during periods of educational disruption.

1.1 Research Motivation

The motivation for this study originates from my professional practice as a College English instructor at D University. Upon completing my master's program, I assumed responsibility for teaching compulsory College English courses to undergraduates representing diverse non-English majors. During the transition to online instruction prompted by the COVID-19 pandemic, my classroom observations revealed significant variations in student engagement levels. While students regularly attended sessions, their involvement often appeared superficial: responses to questions were hesitant or absent, assignment quality declined, and recurring issues, such as incomplete listening tasks, suggested difficulties in maintaining consistent engagement.

These observations indicated that the move to remote learning involved more than a change in platform. Without the structure of a physical classroom, some students seemed less able to manage their own learning, and the boundaries between academic and personal space became less distinct. This situation highlighted the increased importance of self-directed learning and metacognitive awareness, while also revealing that many

students were not yet equipped with the necessary strategies to learn effectively in an online setting.

These experiences led me to question what constituted meaningful engagement in this new context. Common metrics such as login frequency and time online did not adequately reflect the quality of a student's participation or the challenges they might be facing. Through ongoing feedback, informal communication, and teaching evaluations, I noted that students expressed a need for practical institutional resource support, varied forms of interaction, and structured guidance in managing their own learning. This suggested that supporting online learners effectively would require an integrated approach that addressed not only instructional design, but also motivational, social and self-regulatory dimensions. Thus, this study has two aims: to address a gap in engagement literature regarding crisis-driven remote teaching, and to develop a practical, ecological understanding of how learner capabilities interact with external supports to promote effective online learning

D University provides a fitting context for this investigation, as its student body represents a wide range of backgrounds, majors and prior learning experiences. Using a mixed-methods approach, the study will examine how internal learner factors and external support systems interact within the online learning environment. Ultimately, this research hopes to contribute to a more nuanced understanding of student engagement as a continuum of participation, and to offer informed guidance for enhancing the quality and sustainability of College English instruction in online and blended formats.

1.2 Research Background

Although the COVID-19 pandemic prompted a substantial increase in research on Online Student Engagement (OSE) within Chinese College English Teaching (CET), further investigation is needed to identify how environmental and individual factors interact in this context.

1.2.1 The Global Shift to Emergency Online Education

The outbreak of COVID-19 led to a rapid shift to online learning in global higher education, compelling the swift closure of physical campuses. According to the United Nations (2020), this disruption suspended face-to-face instruction for approximately 1.6 billion learners worldwide. Consequently, educators and learners adopted digital platform, such as Zoom, Microsoft Teams and Tencent Meeting, to maintain academic continuity. However, this large-scale transition altered the traditional learning environment from a place-based setting to one mediated by technology. Despite these adaptations, sustaining student engagement within these emergency remote teaching contexts remained a significant challenge.

1.2.2 Challenges Arising from the Pandemic

The abrupt transition to fully online learning highlighted significant gaps in both systemic infrastructure and individual preparedness, leading to challenges in pedagogical practices. The primary obstacle was a shared lack of pedagogical and psychological readiness among educators and students alike (Chiatoh & Chia, 2020; Jasola & Kapoor, 2021; Salas-Pilco, 2023; Wang et al., 2022; Ebrahimi & Jiar, 2018; Atmojo & Nugroho, 2020). This lack of unpreparedness often resulted in diminished teacher-student interaction and reduced levels of classroom engagement within the virtual space (Mardiah, 2020; Salta et al., 2022; Nia et al., 2021). For teachers, these challenges included managing increased workloads and navigating unfamiliar digital tools, which constrained their instructional adaptability. Concurrently, students reported difficulties in adjusting to self-regulated learning routines and maintaining consistent participation in the absence of physical classroom context.

Furthermore, the crisis exposed and exacerbated pre-existing structural inequities. Disparate in technology access, often determined by geography and socio-economic status, contributed to varied learning experiences and outcomes, thereby effectively marginalizing vulnerable communities (Tarryo, 2023; Roy, 2023; Nhlanhla, 2021). Consequently, the online learning environment was characterised by insufficient support, weakened connections and unequal access. This combination of challenges placed significant demands on students' self-regulation and coping mechanism.

Ultimately, the challenges encountered during the pandemic underscore a gap between the technical capabilities of online education and the essential human, structural and relational factors necessary to realize it. This tension basically mediates how and to what extent students are able to engage. Therefore, the study of online student engagement should not be examined in isolation, but must be situated within these broader contextual and often fragile conditions.

1.2.3 The Centrality of Student Engagement in Online Learning

Student engagement is widely recognized as a critical determinant in academic success, as it is strongly associated with enhanced critical thinking, motivation and achievement (Newmann, 1992; Lei et al., 2018; Li & Baker, 2018; Lim & Tondeur, 2022). While various theoretical frameworks have been developed to understand engagement, they remain limited in explaining the dynamic interactions among its core dimensions. For instance, Fredricks et al. (2004) conceptualized engagement as comprising three distinct yet parallel dimensions, behavioural, emotional and cognitive, without clarifying how these dimensions relate to or influence one another. Building on this, Kahu (2013) later proposed a broader cause-and-effect model, yet continued to treat the dimensions as relatively separate rather than structurally interconnected. Similarly, Reeve (2013) emphasized a qualitative distinction between engagement and mere involvement, but the dynamic interplay among the dimensions was not the primary focus of his framework.

Despite these limitations, existing models provide valuable insights into the main theoretical perspectives on student learning engagement, while also highlighting the need for a more integrated understanding of its multidimensional nature. During the pandemic, the role of student learning engagement became increasingly central to educational discourse. Zou, Li and Jin (2021) pointed out that teachers were most frustrated by pedagogical ones, especially students' disengagement in online class. Research has shown that engaged online learners are more likely to persist in their studies, achieve better academic outcomes and report higher satisfaction with their learning experience (Swan, 2003). Conversely, low engagement is linked to increased dropout rates, superficial learning and feelings of disconnection (Chen & Lambert, 2013). Many empirical studies conducted during the pandemic (Rushdi et al., 2024; Yuyun, 2023; Pratiwi and Priyana,

2022; He and Zhou, 2022) have pointed to moderate low levels of student engagement. These studies also reveal notable inconsistencies in the levels of students' emotional, cognitive and behavioural engagement in online learning. As discussed above, these challenges may be partially accountable for the observed outcomes (unsatisfactory engagement). Thus, understanding the factors that drive or hinder engagement in this crisis-induced online context has become imperative to sustaining educational quality.

Contemporary research on online student engagement can be broadly categorized into three main strands. First, some scholars have focused on the current state of college student engagement in online learning environments, proposing theoretical strategies and instructional designs to enhance participation (Wang, 2021; Kaed et al., 2023; Torgbe, 2024). Second, other researchers have explored the influencing factors of online learning engagement, identifying both internal and external elements and deriving practical recommendations from their findings (Luan et al., 2023; Fabian, 2022; Robinson Jr., 2025; Wirawati & Awalin, 2023; Yang & Li, 2021; Faro et al., 2025). Third, a number of studies have examined the relationship between specific factors, such as teacher support (Fu & Chen, 2023; Xu, 2020; Arsenijević et al., 2022) or technology tools (Sun et al., 2014) and learning engagement, testing their effects through interventions. However, these strands are not clearly distinct; studies on teacher support, for instance, could easily fall under the second category. While these studies provide valuable insights, they tend to focus on isolated variables or specific dimensions in OSE, leaving the underlying mechanisms of student engagement insufficiently explored. Moreover, while many studies claim pedagogical implications, few provide rigorous evidence of sustained intervention outcomes. To advance the field, future research should first clarify the conceptual boundaries of engagement dimensions before examining how they interact in real-world online learning environments.

In summary, while prior research has extensively identified the correlates of online learning engagement, it largely adopts a static, outcome-oriented perspective. Crucially, few studies have addressed the dynamic interactions among multilevel factors, ranging from individual psychological states to institutional infrastructures, within the complex ecology of online education. The mechanisms through which these diverse elements

collectively foster or inhibit engagement remain significantly underexplored. To address this gap, this study draws upon Educational Ecology Theory, along with Social Cognitive Theory and Constructivism, to construct an integrated analytical framework. This framework is used to examine how individual, communal and systemic factors interact to influence the dynamic balance and sustainability of online English learning engagement.

1.2.4 College English Online Teaching in the Chinese Context

Given the central role of College English courses within the Chinese higher education system, coupled with the pedagogical transformations accelerated by the pandemic, there is a clear rationale for deeper inquiry into online student engagement in this context. This thesis addresses this need by examining how student engagement, conceptualized across its four key dimensions, interacts with various influencing factors in a dynamical and complex way. The study seeks to elucidate the mechanisms underpinning engagement and to understand how the pandemic has reshaped the online learning experience. The reasons for focusing on College English online teaching are as follows:

1) The Strategic Importance of College English in China

As a core and mandatory component of the national higher education curriculum, College English Teaching (CET) constitutes a foundational and compulsory course system primarily targeting non-English majors, making it a critical index of educational standards in China. It serves not only as a key pathway to enhance students' English language proficiency, but also as a platform to cultivate intercultural communication skills, academic research abilities and lifelong learning capacities. According to *List of Higher Education Institutions* (HEIs) (Ministry of Education of the People's Republic of China, 2025), China hosts 3,167 HEIs, comprising 2,919 regular HEIs (including 1,365 undergraduate institutions and 1,554 higher vocational colleges / specialized colleges) and 248 adult HEIs (as of June 20, 2025). In each Chinese college or university, students must complete a two-year College English course. Students at most undergraduate institutions are required to pass the College English Test Band 4 (CET-4), which is conducted in June and December respectively each year. If a student fails in CET-4, he might face difficulties in obtaining his Bachelor's Degree in some universities. The importance of College English

courses far exceeds people's expectations, due to the requirements for CET-4 scores in social recruitment. In a way, the teaching quality of College English reflects the overall educational standard of a university. Thus, academic research on College English Teaching holds great significance.

2) The Characteristics of College English Online Teaching

Despite the central role of College English, its instructional practice, particularly amid the large-scale shift to online modes, confronts a distinct set of contextual challenges. In the Chinese context, the dynamics of College English online teaching are profoundly shaped by the macro-level guidance of national policies, the scaled transformation of traditional classroom instruction, and the complex interplay of Chinese students' distinctive learning habits and cultural dispositions. Together, these unique conditions constitute a complex educational ecosystem in which student engagement ceases to be merely an expression of individual learning behaviour, and emerges instead as an outcome of multi-layered contextual interactions. Examining how various elements within this system shape engagement therefore calls for a theoretical perspective that moves beyond static attribution. The theory of educational ecology offers a fitting lens for this purpose. However, theory must be integrated with practice. Therefore, to achieve this integration effectively, it is essential to first conduct an examination of the characteristics of online College English teaching.

(1) Policy-driven Digitalization

National initiatives, such as the "Ten-Year Development Plan for Education Informatization (2011-2020)" (Ministry of Education of the People's Republic of China, 2012) and the "Internet Plus Education" strategy (Central People's Government of the People's Republic of China, 2015), had already laid the groundwork for technology integration in College English instruction prior to the pandemic. These policies advocated for personalized and autonomous learning models aligned with the College English Teaching Requirements (Ministry of Education of the People's Republic of China, 2007), encouraging the gradual development of online open courses and digital teaching frameworks. When the COVID-19 pandemic emerged, this existing policy-driven

momentum decisively accelerated the transition to fully online education. Consequently, what had been a gradual, planned shift toward digitalization was rapidly transformed into a nationwide, large-scale experiment in emergency remote teaching. The overall landscape of College English Teaching thus moved decisively toward a digital-oriented future, albeit under conditions that foregrounded both the potential and the challenges of technology-mediated instruction in unexpected ways.

(2) Learner-Specific Traits

Research indicates that Chinese college students, particularly EFL (English as a Foreign Language) learners, exhibit unique needs and challenges in online contexts. These challenges, observed prior to the pandemic, became more apparent during the widespread adoption of emergency remote teaching. Studies suggest that while Chinese EFL learners are prone to benefiting from clear and structured guidance, they often encounter difficulties with asynchronous interaction (Liu, 2017; Han et al., 2021). A significant challenge, heightened in the unstructured home-learning environment of the pandemic, is the difficulty in self-regulation, as students are easily distracted by social media and other online stimuli (Yang et al., 2021). Furthermore, the prevalent cultural preference for teacher-centred instruction in China conflicts with the autonomy required for successful online learning, a tension that became especially acute when direct classroom supervision was removed. These underlying challenges are particularly pronounced among College English students, who frequently view English not as a communicative skill but as an instrumental subject primarily for passing standardized tests like the CET-4. This perception potentially weakened the intrinsic motivation needed to sustain engagement in isolated online learning conditions during the pandemic.

(3) Pandemic-Era Struggles in College English Online Learning

The pandemic-induced transition to full online learning during the pandemic did not introduce new challenges for College English education in China; rather, it exposed and intensified problems that already existed. Before COVID-19, many universities used a blended "synchronous plus asynchronous" model, combining some live online sessions with self-paced digital tasks, all while still relying on the stability of the physical

classroom. In that setting, misalignment between pedagogy and technology or fluctuations in student motivation was typically contained.

The removal of the face-to-face component fundamentally altered this dynamic entirely. Online learning shifted from a supplementary channel to the primary instructional medium. In this context, preexisting frictions widened into critical gaps. The misalignment between instructional methods and digital tools, once a minor friction, became a major barrier to coherence and engagement, as teachers and students were forced to rely exclusively on these imperfect digital interfaces. Similarly, the chronic challenge of student self-regulation and motivation was severely amplified by the isolated, distraction-rich home learning environment, severing learners from the immediate peer support and structured ambiance of the campus. This isolation likely exacerbated foreign language learning anxiety and diminished the instrumental motivation of many students. Therefore, the pandemic period uniquely laid bare how the underlying structural and pedagogical tensions within Chinese College English online education, particularly concerning tool-pedagogy integration and socio-affective support, directly and acutely impede student engagement when the system is placed under sustained operation. This historical moment necessitates a fundamental re-evaluation of how digital learning ecosystems are designed to foster and sustain, rather than inadvertently undermine, meaningful learning engagement.

1.2.5 The Research Gap and Rationale for the Study

While the centrality of student engagement in online learning is well-established, dominant theoretical models have yet to fully account for the dynamics within the specific context of College English education in China. This limitation manifests in three primary research gaps. First, existing frameworks for learning engagement often lack empirical validation in high-stakes online environments, leaving the evolving interplay of motivational and psychological factors in such contexts underexplored. Second, the literature lacks an integrated theoretical framework capable of capturing the dynamic interactions between dimensions of engagement and the various sources of support. Existing research lacks a structured theory capable of revealing the intrinsic interaction mechanisms among the various dimensions of learning engagement and integrating their key influencing factors. Third, most existing research relies heavily on quantitative methods, with few studies using

a mixed-methods design to combine quantitative data and qualitative findings. This shortcoming prevents us from fully understanding the causal relationships between variables, as well as the real experiences and behavioural motivations of learners.

This study addresses key gaps in existing research across theoretical, practical and disciplinary levels. Theoretically, it responds to the need for models that align with the unique traits of online learning by proposing an integrated framework that combines external environments, social cognition and online learning processes. It further explores the interconnections among the core dimensions of engagement, contributing to the contextual application of engagement theory. Practically, the study identifies key factors and their interactions, aiming to provide actionable insight for educators and instructional designers. Disciplinarily, the research enhances a more comprehensive understanding of learning engagement in the digital age, offering a foundation for future interdisciplinary studies.

1.3 Research Aim and Objectives

Grounded in a synthesis of extant literature, this study examines the complex dynamics of College English online teaching and learning during the COVID-19 pandemic, with a specific focus on online student engagement (OSE). By analysing the complexities and challenges inherent in the current instructional practices, this research seeks to develop an integrated framework for understanding the mechanism of online student engagement in the context of online College English teaching in China. The specific objectives of the study are delineated as follows:

- 1) To systematically examine the levels and evolving trends of online student engagement, including behavioural, cognitive, affective and interactive dimensions, within the context of College English online teaching during the pandemic in China.
- 2) To identify and critically assess the multifaceted factors affecting student online learning engagement, and to explore their interrelationships and relative weights across different engagement dimensions.

3) To analyse the underlying mechanisms and theoretical frameworks that drive online student engagement in this specific educational context, with the aim of contributing to a deeper understanding of the dynamics at play.

4) To formulate evidence-based, practical recommendations derived from both qualitative and quantitative findings, which may serve to enhance College English online teaching practices and inform the design and implementation of future online education initiatives.

1.4 Research Significance

This study holds both theoretical and practical significance. It seeks to address the identified gaps in the literature regarding online student engagement (OSE) within the context of COVID-19 Emergency Remote Teaching (ERT). By analysing student engagement in this context, the research provides evidence-based recommendations intended to strengthen the effectiveness of current and future online education initiatives.

1.4.1 Theoretical Significance

This study uses Ecological Systems Theory as its overarching framework, integrating Social Cognitive Theory to connect environmental factors with individual student engagement, and Constructive to explain how learners construct meaning internally. It then systematically explores the multi-dimensional engagement and its underlying mechanisms among Chinese College English learners in online education during the pandemic. This study critically reexamines existing frameworks of student engagement in online education and advances a more holistic perspective tailored to College English online teaching and learning context. It contributes to the field by developing an integrated analytical framework that synthesizes learning engagement, social cognitive, and educational ecosystem theories. This approach clarifies how students interact with various layers of their learning environment in a fully online setting, thereby deepening the theoretical understanding of engagement in digital spaces.

Furthermore, this research addresses a significant gap in the literature. While prior studies have focused mainly on blended or face-to-face environments, this investigation centres exclusively on online learning engagement in College English Teaching. By analysing how

behavioural, cognitive, affective and interactive dimensions evolve in a virtual context, it offers new insights into structural relationship of OSE. Through multi-factor analysis, the study also illuminates the underlying dynamics and mechanisms that shape student engagement, helping to bridge a critical gap in current research and informing more effective online teaching practices.

1.4.2 Practical Significance

Online student engagement has faced unique challenges during the pandemic-era and this highlights how urgently we need practical, actionable strategies to support learners. This study delivers insights and evidence-backed approaches to boost engagement, specifically for College English students in China. What's more, these findings can also apply to a wider range of online learning contexts.

From a policy and practice perspective, the results provide concrete guidance for enhancing online learning environments and increasing engagement. This advice is also applicable to other academic subjects. By identifying what promotes or impedes student engagement in online College English courses, this research equips education policymakers and teachers with the means to design more effective teaching strategies and supportive policies. It also assists educators in refining the creation and delivery of online English classes by pinpointing the key factors that drive engagement. Ultimately, it cultivates a more student-centred and successful digital learning experience.

1.5 Research Contents

This study aims to systematically investigate the state of student engagement in College English online teaching across China during the pandemic. Instead of treating student engagement as a unified concept, the research conceptualizes it as a multidimensional construct comprising four key facets: behavioural engagement, cognitive engagement, affective engagement and interactive engagement. Beyond mapping these dimensions, the study also seeks to uncover the intrinsic mechanisms that support and strengthen student engagement in online learning environments. Specifically, it will examine the four

dimensions of online student engagement in depth, identify the primary factors influencing engagement levels, and analyse the distinct impact of each factor on student engagement.

The research begins with a comprehensive review of relevant literature on online student engagement. It identifies existing gaps, defines core conceptual frameworks and develops a tentative research framework through a process of analysis, synthesis and comparison. Using Ecological Systems Theory as the core framework, supplemented by Social Cognitive Theory and Constructivism, and drawing on established classifications and measurement scales of learning engagement, this study formulates clear operational definitions to guide the research. Subsequently, utilizing a mixed-methods approach that integrates quantitative (statistical data analysis) and qualitative (thematic analysis) research methodologies, this study investigates the influencing factors and intrinsic mechanisms of online engagement among College English students. Finally, based on the empirical findings, the study will offer actionable implications and practical recommendations to enhance the efficacy of College English online teaching.

1.6 Research Questions

The COVID-19 pandemic prompted a shift toward online teaching as a primary mode of College English instruction in China. This study aims to examine the effectiveness of this approach and explore ways to enhance its implementation. The research is structured around the following questions:

- 1) What are the perceptions and experiences of Chinese College English students regarding their online engagement across behavioural, cognitive, affective and interactive dimensions during the pandemic? How do the levels of engagement in these dimensions differ according to students' gender, academic major and year of study?
- 2) What is the relationship between multi-layered support factors (self-support, teacher, peer, institutional, and family support) and online student engagement? To what extent does each support factor uniquely predict the different dimensions of engagement?

3) What intrinsic mechanisms underpin Chinese College English online student engagement, and how can understanding these mechanisms inform strategies for sustainable development in online teaching?

These questions are designed to systematically examine the complexity of online student engagement, identify influential factors and explore the intrinsic mechanisms that drives student online engagement within the context of College English instruction.

1.7 Methodology

This study employs a mixed-methods approach to address the research questions. This approach not only compensates for the limitations of each method individually, but also enhances the validity and reliability of the findings through triangulation. The qualitative strand is designed not only to triangulate the quantitative results but also to explore in depth the intrinsic mechanisms underlying online student engagement.

The research is situated within the context of College English online teaching at a regional comprehensive university in China, focusing on College English teachers and students. This study approach allows for a detailed examination of the specific challenges and dynamics of online engagement in this educational setting, while also offering insights that may be transferable to comparable educational contexts. Adopting a mixed-methods design thus contributes to the empirical basis of this study and offers practical implications for enhancing engagement and the sustainability of online teaching.

1.8 Core Concepts

This study focuses on three core concepts: College English, Student Online Engagement and Educational Ecosystem. The integration of these core constructs establishes rigorous theoretical parameters for analysing how systemic structural configurations shape online learning engagement within digital educational environments.

College English

College English, as designated in the Chinese context, is a compulsory basic course for non-English majors to learn English as a foreign language in undergraduate education. Typically worth 8 credits, it consists of 198 hours of instruction, usually distributed across across four semesters in two academic years. This course aims to develop students' core competencies in five skills: reading, writing, listening, speaking and translation.

Based on the humanistic and instrumental nature of College English (Ministry of Education Higher Education Department, 2007), training in the five skills enables university students to develop basic comprehensive English proficiency. This enables students to understand lectures, read literature, give presentations, write papers and translate materials in English, helping them better comprehend the cultures of English-speaking countries and enhancing the effectiveness of cross-cultural communication. In doing so, it lays a solid foundation for students' academic studies, future careers and cross-cultural exchanges.

Online Student Engagement

Based on the definitions by Bowden (2021) and Fredricks et al. (2004), this study conceptualizes online student engagement as the multidimensional involvement of students across cognitive, affective, behavioural and interactive dimensions within the online learning environment. This concept includes interactions with university teachers, peers, technology, family and the institution itself. While the literature employs various terms, such as "online student engagement (OSE)" to emphasize the online learning environment, or "student online engagement (SOE)" to highlight students' learning activities in the online context, this study treats these terms as interchangeable and adopts OSE as the primary concept.

Educational Ecosystem

In this study, Educational Ecosystem refers to a complex, interconnected network of individuals, institutions, resources and policies that collectively shape and support the process of teaching and learning. It draws on ecological principles, specifically Bronfenbrenner's Ecological Systems Theory, to describe how various components within

an online educational environment interact, adapt and evolve to create a dynamic and sustainable ecosystem.

1.9 The Structure

The thesis is structured into six chapters, as follows:

Chapter 1 situates this study within the rapid transition to online learning during the pandemic, highlighting the particular challenges faced by College English Teaching and establishes the practical necessity of the research. It outlines the research aim, research questions, core concepts and overall structure, while highlighting the theoretical and practical significance of understanding how and why students engage or disengage in online teaching environments.

Chapter 2 synthesizes literature on Online Student Engagement (OSE), examining its manifestations during the pandemic, theoretical foundations, and measurement approaches. Synthesizing influencing factors through the lens of Educational Ecological Theory, it reveals a limited understanding of their systemic interrelationships. This gap, particularly in understanding intrinsic mechanisms and factor weightings, informs the research questions and methodological approach of this thesis.

Chapter 3 details the research methodology, building on a mixed-methods approach. The chapter begins by introducing the study population, the sampling strategy and the development of the research instruments. Two questionnaires are designed to assess student engagement and its influencing factors. Both are pilot-tested to assess their clarity, coherence and psychometric properties. The procedures for data collection and analysis are then outlined, including the use of descriptive statistics, correlation analysis and multiple linear regression, alongside thematic analysis of interview data. Measures taken to ensure the reliability and validity of the instruments are discussed, and steps undertaken to uphold ethical standards, such as informed consent, confidentiality and participant anonymity, are also described.

Chapter 4 presents the integrated findings of the study, combining quantitative and qualitative analyses to provide a comprehensive understanding of online student engagement in the context of College English online teaching. The chapter starts by examining quantitative questionnaire data to describe the state of OSE across four dimensions and its correlations with five supporting factors. By using multiple linear regression, the chapter determines their relative weights. Qualitative interview data are then analysed thematically to illuminate these patterns. The mixed-methods approach offers a holistic view of the College English online teaching ecosystem.

Chapter 5 constitutes the discussion section. It presents the arguments of this study by interpreting the research findings, connecting them to the theoretical framework that guided the study, and relating them to previous research. By highlighting points of agreement or contradiction with existing literature, it provides a deeper interpretation of the findings and outlines their implications for College English online teaching. Finally, it proposes an integrated theoretical framework for online student engagement in College English Teaching.

Chapter 6 serves as the concluding chapter. It synthesizes the key findings, elaborates on the study's theoretical and practical contributions, acknowledges its limitations, and puts forward actionable recommendations alongside potential directions for future research.

Chapter 2 Literature Review

While existing scholarship has extensively mapped online student engagement through the established tripartite constructs of cognitive, behavioural and emotional dimensions, most studies predominantly adopt a static trait-based perspective. Such approaches often provide limited insight into explicating the underlying mechanisms by which engagement is dynamically reconfigured under different contextual pressures. The COVID-19 pandemic served not merely as a disruption but as a critical juncture, exposing the explanatory limitations of these linear models and underscoring the need for a multi-level mechanism framework. Focusing on College English learners, this study examines how online student engagement (OSE) operated under pandemic-related constraints, outlines several gaps in the current literature and establishes a context-sensitive definition that underpins the necessity and significance of this study.

2.1 Conceptual Fragmentation in Theories, Definitions and Dimensions

Conceptualization of student engagement has evolved from static, one-dimensional metrics to increasingly complex dynamic models. Yet, a significant theoretical gap persists in explaining the processes by which engagement is sustained and reshaped in specific contexts. By synthesizing these fragmented accounts, this section identifies the limitations of current explanatory models and highlights the need for a context-sensitive investigation into the mechanisms sustaining engagement.

2.1.1 Conceptual Evolution of the Core Construct

While student engagement is now widely accepted as a predictor of success (Kuh, 2009), its conceptual foundations reveal a persistent tension between individual agency and institutional responsibility. This development began with Ralph Tyler (1949), who, in *Basic Principles of Curriculum and Instruction*, first established the relationship between time-on-task and learning outcomes, and constructed engagement as a decontextualised input, assuming a direct causal link between mere duration and learning outcomes. Alexander Astin (1984) expanded this view with his Student Involvement Theory and

redefined engagement as the time and energy that students devoted to educationally purposeful activities. Yet, both perspectives arguably place the responsibility of success almost entirely on the student, framing engagement as an individual psychological trait rather than a systemic outcome. Directly confronting this limitation, George Kuh (2009) embedded engagement within a socio-institutional frame. He defined engagement that "the time and effort students devote to activities empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities" (p. 683). By framing engagement as a reciprocal process, Kuh argued that learning is a shared responsibility between the individual and the institution, bridging the gap between Astin's student-focused theory and the operational needs of higher education. This shift from a purely psychological to a socio-institutional view solidified engagement as a central concern for higher education policy and assessment.

While the earlier definitions of student engagement provide a useful starting point, they are limited in scope and insufficient for understanding the full complexity of learning in today's dynamic educational environments. A more comprehensive and widely cited conceptualization comes from Fredricks and Paris (2004), who defined that student engagement as a multidimensional construct, consisting of behavioural, emotional (affective) and cognitive components. This tripartite model significantly broadened the research dimensions of student engagement. As a result, rather than being viewed as a single and static construct, student engagement is now widely regarded as a complex and dynamic process, including interrelated psychological, emotional, behavioural and cognitive dimensions. However, simply layering these dimensions does not inherently explain how they interact under pressure. Following scholarship has attempted to fill this gap. For instance, while Wong and Liem (2022) emphasize the importance of effort, determination and enthusiasm, Reeve et al. (2025) highlight the role of self-determination and intrinsic motivation. Similarly, Nelson et al. (2024) explore how personal attributes, social relationships and environmental contexts interact to shape student engagement. Together, these perspectives highlight a key insight: student engagement is not merely about observable participation, but also about internalized commitment, motivation and interactional dynamics that drive meaningful learning. Treating engagement as a singular construct risks obscuring the very power dynamics and contextual specificities that this

study seeks to unpack.

Despite its widespread recognition, the precise definition and conceptual boundaries of student engagement remain fluid and contested. As Harrington, Sinfield and Burns (2016) note, not all students demonstrate engagement in the same way, and interpretations of the term vary depending on one's role within the educational system. Taken together, these perspectives illustrate that engagement is not a fixed trait, but a dynamic and contextually shaped experience.

2.1.2 Dimensional Configurations and Process Models

The conceptualization of student engagement has evolved from treating it as a static outcome to viewing it as a configured system of mechanisms. While most scholars agree that engagement is multi-dimensional, the field remains fractured by definitional disputes regarding its core components. These dimensions often vary depending on the research context, theoretical orientation and methodological approach employed. Among the early models, Finn (1993) reduced engagement to two dimensions: behavioural and emotional. While this simplified view advanced initial understandings, it offered a limited scope regarding the internal regulatory mechanisms essential for deep learning. Fredricks et al. (2004) arguably expanded this perspective by integrating these insights into a more holistic tri-dimensional framework including behavioural, emotional and cognitive engagement. Each of the three primary dimensions is distinct but mutually reinforcing. They are mutually constitutive rather than linearly additive. This model moved the conversation beyond surface actions and feelings, acknowledging the deeper mental investment required for meaningful learning. Although Fredricks et al.'s (2004) tripartite model is the prevailing framework, its conceptual clarity often fails to capture the operational complexity of real-world learning. This has led to a proliferation of context-dependent dimensions, such as Reeve's (2013) agentic engagement, which, while addressing specific gaps like student autonomy, exemplify the field's additive tendency, inserting new components rather than explaining the relational mechanics of the core model. As Montenegro (2017) critiques, such additions often remain theoretically isolated. This issue aligns with a widespread trend in existing research. Scholars such as Skinner et al. (2009) have often organized their

research around distinct pairs of dimensions, an approach that has, over time, led to somewhat separate areas of study within the field.

A consequence of this practice is a methodological inclination to measure dimensions in isolation, rather than examining them as integrated, interactive configurations. There remains a paucity of empirically testable accounts detailing how these dimensions dynamically influence one another, for instance, how affective declines interfere with ongoing cognitive processing. Accordingly, the key research gap in this domain is not the absence of new dimensional categories, but the lack of a coherent process theory to explain underlying mechanisms. This theoretical shortfall is particularly consequential in complex, low-visibility contexts such as College English instruction. In these settings, unpacking internal psychological and cognitive dynamics is essential to advancing research, which in turn necessitates a deliberate shift away from static dimensional classification toward dynamic systemic modelling.

Overall, the current research on student engagement currently focuses on specific contexts, lacking unified theories and broader validation, which complicates the synthesis of findings or the identification of underlying causes. This underscores the need to develop a consolidated yet context-sensitive theoretical framework for digital learning, which in turn provides a theoretical groundwork to inform evidence-based educational practice.

2.1.3 Reconceptualizing Engagement in Online Learning Contexts

This research cannot simply transfer offline engagement frameworks directly into online learning environments. Instead, it requires an examination of the mechanisms that generate engagement within fully online systems. A persistent challenge in the field is the lack of consistent agreement on how engagement is defined and operationalised, often resulting in disjointed research findings that are often difficult to compare or synthesise.

This fragmentation often arises from the justifiable need for contextual relevance, which can inadvertently undermine theoretical coherence. For instance, Pratiwi and Priyana's (2022) study of Indonesian students defines four pragmatic dimensions, skills, emotion, participation and performance, prioritizing immediate situational applicability. Similarly,

Yuyun's (2023) framework separates collaborative engagement (task-focused interaction) from social engagement (relationship-focused interaction). His highly detailed delineation enhances definitional specificity but may reduce theoretical parsimony. While such tailored models offer localized insights, they collectively exemplify a trend where contextual adaptation may overshadow the development of a shared theoretical foundation. This has led to a proliferation of custom models that inhibit scholarly dialogue regarding the fundamental architecture of engagement.

To advance beyond this fragmentation, a reconceptualization for specific contexts like online College English must be both integrative and theory-driven. It should not merely compile dimensions but logically derive them from the learning context's core demands. In this environment, engagement is thus theorized as a multi-dimensional construct encompassing behavioural, cognitive, affective, and interactive elements. The inclusion of a distinct interactive dimension is a key theoretical consideration, not a mere addition. Rooted in sociocultural theory (Vygotsky, 1978), it posits interaction as the essential medium through which cognition and learning are mediated. This is especially salient in a foreign language context like College English, where authentic interaction is not just supportive but constitutive of the learning objective. It captures both the action of interacting and the relational fabric that sustains cognitive and affective investment. This integrated framework serves a dual purpose: it provides the consistent conceptual structure needed to transcend fragmentation, while its interactive dimension explicitly addresses the core sociocultural and pedagogical mechanism of online language learning.

The characteristics of online learning are reflected not only in its dimensional structure but also in the shifts of emphasis within the specific content of each dimension. In online contexts, their definitions of the four dimensions are fundamentally shaped by digital affordances and constraints. Behavioural engagement is typically understood as observable participation, yet in online settings, this expands beyond mere attendance to include nuanced digital footprints, interaction frequency, forum contributions and task completion within a Learning Management System (Sun et al., 2025). Similarly, cognitive engagement in digital environments increasingly emphasizes self-regulated learning and the strategic management of attention and cognitive effort when navigating complex, often

asynchronous, content (Sun et al., 2025). Affective engagement is mediated by the perceived presence of instructors and peers, as well as the usability of the digital interface itself (Chiu, 2022). Finally, interactive engagement captures the relational and communicative fabric of learning.

2.1.4 The Operationalization of Online Student Engagement

To systematically analyse and enhance the complex phenomenon of online student engagement, this study synthesizes the definitions by Bowden (2021) and Fredricks et al. (2004), conceptualising it as students' active engagement in the online learning environment. This conceptualisation is operationalized through a four-dimensional framework (in 2.1.3), in which each dimension represents a distinct yet interconnected facet of the engagement construct.

Behavioural Engagement encompasses observable actions and participation patterns within the digital environment, such as platform logins, task completion and time-on-task.

Cognitive Engagement refers to the level of mental effort learners devote to their studies, involving knowledge building, critical thinking and the application of strategies to understand learning material.

Affective Engagement relates to the emotional dimension of learning, including interest, satisfaction, frustration, a sense of belonging, and the perceived value of learning activities.

Interactive Engagement is defined as a learner's active and meaningful participation in social and transactional exchanges, which includes interactions with peers, instructors, and digital interfaces, as well as perceived relational support and community connectedness.

By integrating these four dimensions, the framework facilitates a comprehensive assessment of how students act, think, feel and connect in online learning spaces. This provides a comprehensive understanding of their learning experiences and processes. Thus, this model moves beyond fragmented approaches to provide a holistic, integrated lens for capturing the multifaceted dynamics of learner involvement, particularly in contextualized subjects like College English.

2.2 The Analytical Framework

To address the theoretical fragmentation and limited integrative capacity observed in current online learning engagement research, this study aims to develop an integrated theoretical framework. Rather than relying on a single explanatory model, the framework adopts Bronfenbrenner's Ecological Systems Theory as the primary organising structure. It incorporates Bandura's Social Cognitive Theory to elucidate the dynamic interplay between individual agency and environmental contexts, and utilizes Constructivism to inform the design of meaningful learning interactions. This multi-theoretical synthesis facilitates a comprehensive, multi-level examination of the mechanisms underlying student engagement within the specific context of College English teaching during the pandemic period.

2.2.1 Theoretical Constraints of Current Frameworks

While a diverse array of theories, including the Community of Inquiry (CoI) (Arsenijević J, et al, 2022), Self-Determination Theory (Schwab C., et al., 2022), and the Technology Acceptance Model (TAM) (Zou, et al., 2021), has been employed to examine online learning engagement during the pandemic, this theoretical pluralism often presents a significant challenge: fragmentation and a lack of integrative capacity. Scholars often utilize these theories to address specific facets of the learning process. For instance, they draw on the Community of Inquiry framework to unpack social interactions, rely on the Technology Acceptance Model to forecast user adoption of digital tools, and turn to self-efficacy theory to account for learners' sustained effort. Though this piecemeal approach generates targeted, granular findings, it inadvertently breaks the multifaceted systemic process of online learning engagement into disjointed, separate fragments. Over time, this leaves the research field with a patchwork of unconnected results.

A notable limitation is that existing research often prioritizes a single level of analysis, whether it is individual psychological factors (e.g., self-determination), technological determinants (e.g., TAM), or social interactional dynamics (e.g., CoI), without adequately modelling their dynamic interrelationships. This theoretical fragmentation underscores the need for a more cohesive explanatory framework. Therefore, rather than merely applying a

single existing theory, this study will not merely apply a theory, but seeks to develop an integrated theoretical framework. This involves selecting a core, integrative theory and deliberately articulating how it interfaces with complementary constructs to provide a more holistic, multi-level explanation of engagement mechanisms.

2.2.2 Justification for the Theoretical Framework

A single theoretical perspective is insufficient to capture the complexity of the mechanism underlying online student engagement. To address the above-mentioned limitation, this study's theoretical framework centres on Bronfenbrenner's Ecological Systems Theory as the primary analytical lens, embeds Bandura's Social Cognitive Theory, specifically triadic reciprocal determinism, to elaborate the functional mechanism linking environments and individual learners, and takes constructivism as its foundational background theory. This configuration forms an embedded theoretical framework anchored in ecological systems theory, designed to provide a holistic, multi-layered understanding of the engagement mechanism within the context of pandemic-era College English Teaching.

Within this theoretical framework, the ecological perspective serves as the overarching structure that integrates the other two theories. Three theories converge on a shared premise: that learning is inseparable from environment and interaction. Rather than resolving tensions between them, the ecological lens synthesizes the core concepts of Social Cognitive Theory (SCT) and Constructivism. Specifically, SCT explains how personal factor interacts with the environment to shape engagement. Constructivism guides the design of environments that encourage active participation. Educational ecology sees online teaching as an interconnected system. Together, they address the need for sustainable and balanced online environments (from Ecology) that enhance learner agency (from SCT) and drive active engagement (from Constructivism). This framework focuses on holistic and interdependent teaching ecosystems, aligning with Jackson's (2013) definition of an ecosystem as a stable, self-regulating system of coexisting components that exchange resources and maintain balance.

2.2.3 How the Theoretical Framework Guides This Study

By synthesizing Social Cognitive Theory, Constructivism and Educational Ecological

Theory, this study describes how an integrated theoretical framework informs the investigation of online student engagement. It outlines the mechanisms driving engagement and identifies key influencing factors operating at both micro and macro levels.

1) Social Cognitive Theory and Constructivism as Agentic Mechanisms

To capture the complexity of online student engagement, this study integrates two complementary theoretical perspectives at the individual level: Social Cognitive Theory (SCT) and Constructivism. These theories function as core mechanisms that account for how engagement is generated through the dynamic interplay between individual agency and instructional design. Unlike macro-level ecological models, SCT and Constructivism provide the explanatory depth required to understand the micro-level processes of learning. By positioning engagement as an emergent property of this interplay, the framework moves beyond approaches that isolate learners from their environment. This integration allows for a more detailed analysis of how personal factors, behavioural patterns and environmental contexts reciprocally influence one another within the online learning ecosystem.

Social Cognitive Theory, developed by Bandura (1977, 1986), provides a critical foundation for understanding the reciprocal dynamics of engagement. Central to this is the principle of triadic reciprocal determinism, which focuses on the bidirectional interactions among personal factors (including cognition, emotions and self-efficacy, which is defined as one's belief in their ability to complete tasks), environmental factors (such as online platforms, resources and psychological context) and behaviour (learning engagement). Yet in reality, particularly in online learning contexts, such interactions rarely hold. As a result, the triadic model may understate the structural imbalances that shape student engagement in online teaching settings.

A central construct within SCT is self-efficacy which refers to an individual's belief in their own ability to execute specific tasks. Research on SCT links higher online learning self-efficacy to greater engagement, such as making more effort toward learning goals. Social Cognitive Theory advocates that learning environments, cognitive factors and learning behaviours dynamically interact, with self-efficacy as a crucial cognitive factor

playing a significant role in this interaction (Bandura, 1977). Research supports this link, with studies showing that higher self-efficacy enhances the impact of teaching competencies on engagement (Rahim, 2022) and that students with greater digital competence and proactive help-seeking behaviours are more likely to sustain their engagement (Wang et al., 2021). Their findings should be interpreted with care, because the studies may not fully consider how environmental factors shape self-efficacy. Social Cognitive Theory foregrounds the agency of learners, while also recognizing the power of context in shaping their actions.

While SCT explains the *why* behind engagement through personal agency, Constructivism addresses the *how* through the process of active knowledge construction. Rooted in the work of Piaget (1954) and Vygotsky (1978), this theory argues that learners actively construct knowledge through interaction with their environment, prior experiences and social contexts. Piaget emphasizes the cognitive side, while Vygotsky pays significant attention to the social and cultural dimensions of learning, which frames engagement as a collaborative activity dependent on interaction with peers and instructors. This perspective aligns with research indicating that fulfilling psychological needs for competence, autonomy and relatedness, key components of a constructive learning environment, significantly enhances online engagement (Chiu, 2021). Yet the perspectives are assumed in a relatively stable and supportive learning environment, not reflecting the critical, fragmented realities that students face, particularly in emergency remote teaching like the COVID-19 pandemic.

Collectively, SCT and Constructivism function as a dual-mechanism engine for engagement. SCT elucidates the energetic drivers of agency and self-regulation, while Constructivism explains the cognitive architecture of active, socially mediated learning. However, the explanatory power of these psychological and instructional lenses is inherently micro-level, often bracketing out the systemic structures that enable or constrain these processes. To capture the full ecology of engagement, this framework must be situated within a broader structural context. Consequently, Educational Ecological Theory is introduced as an essential macro-level complement, mapping the systemic factors that determine the sustainability and equity of engagement in online learning environments.

2) Educational Ecological Theory as Nested Systemic Mechanisms

To complement the micro-level focus of psychological and instructional theories, this framework integrates Educational Ecological Theory to map the nested systemic mechanisms that contextualize online student engagement. This addition is necessary because engagement is the product of a dynamic, multi-layered system of environmental influences.

Educational Ecological Theory is operationalised primarily, in this study, around Bronfenbrenner's Ecological Systems Theory and its theoretical extensions. It emphasizes the importance of contextual and environmental factors in shaping student engagement, yet it often oversimplifies the dynamic, bidirectional interplay between individual agency and structural surroundings. Rooted in Ashby's (1966) work and refined by Bronfenbrenner (1979), Ecological Systems Theory explains how individuals adapt and how their learning and development are shaped by language, culture, and environment. Bronfenbrenner's model outlines five interconnected levels: the micro-, meso-, exo-, macro-, and chronosystems. Seen in its application to curriculum design and its noted influence in areas such as foreign language education (Chen,2010; Li,2022), the theory's continued evolution demonstrates its capacity to adapt and remain relevant across educational domains. The strength of this theory lies in its ability to provide a more complete picture of the forces influencing a student's life in a ecosystem.

In this study, the ecosystem of OSE is categorized into four-level systems:

Microsystem: The immediate environment (e.g., student-self environment).

Mesosystem: The connections between microsystems (e.g., how teacher and peer influence student-self activities).

Exosystem: External structures that indirectly influence the student (e.g., university pandemic policies, LMS platform design choices, faculty training programs).

Macrosystem: The broader cultural and social context (e.g., the norms of emergency remote teaching, Chinese educational values, societal attitudes towards technology in education).

The most significant departure from the classic ecosystem model is that this study positions the student-self as a microsystem, which is a key innovation of the present research. This addresses a major critique of ecological models, the under-specified individual, by reconceptualizing the student as an active, internal ecosystem of cognitive, affective and metacognitive subsystems. This aligns with and extends Bronfenbrenner's (1998) PPCT (Process-Person-Context-Time) model, which centres the individual as an agent mediating environments through personal capacity, motivation, and power (ecological niche). This framing enables the analysis of reciprocal interactions between the internal student-self (e.g., self-efficacy, anxiety) and external systems (e.g., teacher presence, peer feedback), integrating ecological and social-cognitive theories. Furthermore, in technology-mediated contexts like pandemic-era College English learning, the student's internal realm of self-regulation and digital competence functions as the primary learning 'space'. Thus, this approach provides a structured lens for examining engagement as a dynamic interface between internal agency and ecological forces.

Bronfenbrenner's Ecological Systems Theory offers a valuable, multi-layered model that captures the complex environmental support of development. It "translates" ecological concepts (ecosystem, niche, interdependence) into social systems. However, in crisis-driven or fully online environments characterized by rapid change, resource inequities, and institutional constraints, the assumed stability and connectivity of ecological systems may break down. Therefore, rather than adopting an ecological lens uncritically, this study argues for a more reflexive and critical ecological framework. Such an approach should not only map systemic influences but also identify where connections are disrupted or weakened.

2.3 The Interplay of Multi-level Factors in Shaping Online Student Engagement

Under the study's framework, online student engagement is increasingly understood not as a static outcome, but as an emergent property generated by the dynamic interplay of individual psychological resources and nested environmental systems. Given its importance, extensive scholarly attentions have been carried out to identify factors that affect online student engagement in higher education institutions in different contexts (Bansal et al. 2023; Salas-Pilco et al. 2022; Yam and McKinley 2025; Li and Xue, 2023; Qin and Saidin, 2024; Faro et al., 2025; Zhang et al., 2024). However, much of this research has focused on these factors as distinct variables, rather than exploring how they dynamically align or conflict within a specific environmental context. This integrated framework adopted in this study provides the necessary analytical tools to map these interactive influence mechanisms. It moves beyond merely identifying factors to explain how individual agency and environmental systems collectively shape the conditions for, or against, sustained student engagement particularly within the interactive context of the pandemic-era College English online teaching ecosystem.

2.3.1 Internal Factors as a Dynamic Driving Mechanism

While often positioned as the foundational drivers of engagement, internal student factors are reconceptualized here not as a static checklist of traits, but as a dynamic driving mechanism. Ng and Rodrigo (2022) listed student factor as one of major five themes. Internal factors, the most prevalent factors associated with student engagement, were student-related factors, such as student self-efficacy, emotion, motivation, attitude, personality traits and student-student interaction (Limbu & McKinley, 2024). Yin and Saidin (2025) classify the internal factors influencing online student engagement as learning motivation, self-efficacy, beliefs, autonomy and learning strategies. Myint and Khaing (2020) believes that internal factors are specific to students. Together, these factors form a dynamic psychological system, where motivation, self-efficacy and self-regulation, act as interactive forces. In the context of online learning, this system is neither static nor universally empowering. The autonomy inherent in digital environments magnifies the

influence of these internal factors and reshapes their modes of operation as well. Therefore, understanding intrinsic factors requires moving beyond measuring their presence to analysing how they interact synergistically to drive, or fail to drive, the engagement mechanism in the context of online College English learning.

1) Motivation as a Driver of Initial Engagement

Motivation provides the initial drive that starts the learning process and leads to engagement. While intrinsic motivation is crucial for deep and sustained involvement. Extrinsic motivation can potentially undermine this internal drive. The relationship between the two is dynamic, and extrinsic motivation can potentially be internalized under supportive conditions.

While learning motivation is conventionally defined as the psychological drive toward learning goals (Wolters & Benzon, 2013), its role in online environments is critically important. In online learning, where students have more independence and less direct supervision, the responsibility for staying engaged naturally shifts from the institution to the learners themselves. This makes motivation not just a helpful extra, but a basic requirement for keeping up and participating meaningfully. The literature strongly supports the primacy of intrinsic motivation, the drive derived from inherent interest and enjoyment, for fostering deep and sustained engagement. For instance, Li et al. (2022) demonstrate that autonomy-supportive teaching strategies, which foster the experience of choice and autonomous motivation of students, are strongly correlated with higher engagement. This positions intrinsic motivation as a dynamic construct rather than a fixed input. This view is refined by Akram and Li (2024), who identify intrinsic motivation as a central mediating variable that translates positive teacher-student interactions into deeper engagement. This crucial insight suggests that even well-designed social interactions may fail if they do not ultimately stimulate the learner's internal interest and sense of ownership.

In contrast, the role of extrinsic motivation, which is driven by external rewards such as grades, prizes or praise, shows a significant tension between managing student behaviour and substantial engagement. The scholarly debate is not simply a matter of effectiveness, but one of context and depth. Extrinsic motivators have been shown to promote

engagement, particularly in contexts like the emergency remote teaching during the pandemic, where the primary objective was to maintain basic participation (Adnan, 2020; Laili & Nashir, 2021). These motivators are likely effective for ensuring compliance and surface-level behavioural engagement, such as logging in or meeting deadlines, especially in compulsory courses. However, this utility has clear limits. Li et al.'s (2022) findings suggest that the link between extrinsic motivation and deeper engagement is insufficient to reliably support cognitive and emotional investment. More critically, an over-reliance on extrinsic rewards can trigger the potential "overjustification effect" (Deci et al., 1971). A recognized phenomenon is that external incentives weaken intrinsic interest, potentially reducing the drive that supports long-term engagement.

Framing the debate as a simple binary between intrinsic and extrinsic motivation fails to capture the dynamic interplay of regulatory styles outlined in Self-Determination Theory (2004). As Gao (2016) notes, extrinsic motivation can evolve toward greater autonomy under certain conditions and internalize into stable internal motivation, ultimately more effectively promoting online learning engagement. Intrinsic and extrinsic motivations are not mutually exclusive, but produce distinct types of engagement. Extrinsic motivation may effectively secure surface-level compliance, ensuring baseline participation in structured or mandatory environments. Intrinsic motivation, however, is the essential driver for deep engagement, driving the curiosity, persistence and cognitive investment that characterize high-quality learning outcomes in self-directed online settings. Thus, the relationship between extrinsic motivation and online learning engagement is relatively complex, and its impact on online learning engagement mainly depends on the degree of autonomy of the extrinsic motivation.

Motivation provides the initial energy and direction for online learning engagement. However, motivation alone is insufficient to ensure successful engagement. Whether learners believe they have the ability to perform learning tasks and achieve goals in a challenging online environment constitutes another key psychological threshold in the engagement process. That is the contextual role of self-efficacy.

2) Limits and Contingencies of Self-Efficacy in Online Learning

Self-efficacy, defined as a student's belief in their capability to successfully execute learning tasks within an online environment, is widely recognized as an important condition of engagement and academic success (Bandura, 1997). Nevertheless, the focus on this construct often overshadows its conceptual and practical limitations. A substantial body of research consistently links higher levels of self-efficacy to more effective navigation of online courses and greater active participation (Bates & Khasawneh, 2007). Yet this correlation conceals a critical nuance: self-efficacy is not equally attainable for everyone, and it is often more influenced by context than by character. The mechanism for this link, as explained by Usher and Pajares (2008), is that self-efficacy fosters the confidence, goal-setting and perseverance necessary for sustained engagement. However, in under-resourced or poorly designed online environments, even the most capable students may experience a decline in their self-efficacy. Although self-efficacy can be a critical determinant, it is not a neutral one.

The positive relationship between self-efficacy and engagement is well established in the literature, with consistent findings emerging across different learning contexts. Studies such as Ye (2023) have found that students' academic self-efficacy is positively associated with cognitive, emotional and behavioural engagement. This relationship is further supported by longitudinal and cross-sectional analyses (Faro et al., 2025; Li & Xue, 2023), which indicate that self-efficacy operates through both direct and indirect pathways. It not only drives engagement directly, but also enhances it indirectly by promoting the use of other supportive learning strategies, solidifying its status as a stable predictor of student involvement (Zhou, 2023). Yet the findings overlook a crucial point: self-efficacy does not exist in a vacuum. Treating self-efficacy as a reliable predictor makes sense, but only if we also examine why some students are able to develop it more easily, while others lack consistent access to the support and opportunities needed to build it.

A more distinctive analysis reveals that the power of self-efficacy is closely linked to the learner's stage of life and primary social role. For traditional undergraduate students, whose "student" identity is central and often fragile, beliefs about academic capabilities (academic self-efficacy) are of utmost importance. In this context, the findings of Huang (2023) and Han et al. (2021) remain valid: self-efficacy serves as a crucial mediator and direct driver

of engagement. In stark contrast, as shown in Yusriani's (2023) study, for working professionals and adult learners, self-concept is often built on a foundation of professional competence and life experience. For these individuals, a temporary struggle in an academic setting may represent a specific contextual challenge rather than a fundamental threat to their self-worth. For these learners, engagement is more reliably sparked by practical concerns (whether the course connects to career goals or offers meaningful peer interaction) than by abstract notions of mastering academic challenges. Essentially, self-efficacy is the most critical factor for engagement among populations where the student role is central.

Self-efficacy is a complex construct made up of diverse interrelated components. Recent studies spanning 2021 to 2025 (Faro et al., 2025; Li & Xue, 2023; Terro, 2021; Adeshola & Agoyi, 2022; Heo et al., 2021) reinforce this perspective and illustrate that self-efficacy improves online learning outcomes by strengthening engagement-related facilitators. The pandemic has further underscored the value of technological self-efficacy, namely learners' confidence in employing digital tools for study. This adds a critical layer of contingency. For all learners, but especially for those less familiar with technology, low technological self-efficacy can create a barrier that overwhelms even strong academic self-efficacy. A student confident in their subject knowledge may become disengaged if they lack confidence in navigating the learning platform. This interaction between academic and technological self-efficacy dimensions suggests that they can conflict in their impact on overall engagement, demanding a more thorough approach to measurement and support.

Self-efficacy thus reflects learners' belief in their abilities. However, transforming this belief into sustained and effective learning actions, especially in online environments with less external supervision, requires advanced cognitive and managerial skills. This brings us to the most comprehensive and challenging aspect of student-related factors: autonomous learning capacity. Online student engagement fundamentally requires us to re-evaluate self-regulated learning.

3) Self-Regulated Learning as a Key Self-Management Skill

While traditional educational settings conceptualize self-regulated learning (SRL) as a voluntary, learner-driven process (Zimmerman, 2000), applying this construct to digital

learning contexts reveals a critical gap in both theory and instructional practice. The shift to online learning has fundamentally altered this dynamic, transforming SRL from a beneficial skill into a structural mandate for success (Salas-Pilco et al., 2022). Despite the clear link between self-regulated learning and engagement, the failure to provide the necessary teaching and systemic support for developing these skills can exacerbate existing disparities.

To move beyond a superficial understanding of self-regulated learning (SRL) in online learning contexts, we must critically examine its dialectical relationship with metacognition and student engagement. Metacognition which is defined as the ability to reflect on, monitor and regulate one's own thinking serves as the "key link" between SRL and successful autonomous learning (Wolters & Taylor, 2012). Without metacognitive skills, learners cannot effectively implement SRL. They may set goals but lack the awareness to adjust strategies when those goals are not being met. In short, metacognition is the cognitive "engine" that drives SRL. Equally important is the link between SRL and student engagement. Fredricks et al. (2004) clarify that cognitive engagement, arguably the most impactful for long-term learning, relies on SRL strategies. This connection means that weak SRL is not just a barrier to task completion but to meaningful engagement with course content.

A growing body of empirical research reinforces the link between SRL and student engagement in online settings, yet these findings must be interpreted critically. Churiyah et al. (2020) found that students with low self-regulated learning were less likely to regulate their participation in distance-learning activities during the COVID-19 pandemic. Expanding on this, Kangwa et al. (2024) observe that self-regulation in online learning has a moderately significant impact on behavioural, emotional and cognitive engagement. Similarly, Soner (2021) identified a strong positive correlation between online self-regulation and student engagement in online settings. While the autonomy inherent in online learning places the primary responsibility for time management, resource navigation and persistence squarely on the learner, this shift can amplify existing disparities. As Landrum (2020) argues, poor outcomes in online settings are frequently linked to insufficient SRL skills rather than a lack of motivation. This reveals a critical inequity: the

flexibility of online learning primarily benefits those who already possess strong self-regulation, while leaving behind those who have not had the opportunity to develop these competencies. The environment itself, therefore, can act as a mechanism that widens the achievement gap.

The literature often presents a simplified, unidirectional narrative in which SRL serves as a primary driver of cognitive, behavioural and emotional engagement (Fredricks et al., 2004). While empirically convenient, this framing rests on fragile assumptions. First, it often neglects the central role of metacognition. Online designs frequently assume that learners possess these metacognitive skills, creating a circular problem where students need them to succeed but are rarely explicitly taught them (River et al., 2022). Second, methodological approaches often mistake correlation with causation. For instance, while Churiyah et al. (2020) found a correlation between low SRL and low participation during COVID-19, reverse causality is equally plausible: poor course design (e.g., unclear expectations, lack of structure) may cause disengagement, which in turn reduces students' capacity to self-regulate. Similarly, Alteshehr et al. (2023) find positive correlations between SRL, wellbeing and engagement but rely on cross-sectional data, leaving the direction of causality unclear. Thus, the presumed primacy of SRL in driving engagement is far from settled. By failing to incorporate metacognitive training and critically examine how cause and effect operate, the study may end up constructing educational policies and teaching practices on an incomplete empirical foundation.

Recent research has begun to address these complexities but leaves significant gaps. Kangwa et al. (2024) offer a crucial advancement by framing SRL as a mediator between teacher scaffolding and engagement, breaking the unidirectional narrative by showing how SRL translates instructional support into action. However, this model still fails to address how to support learners who begin with underdeveloped SRL skills; those lacking SRL cannot effectively utilize teacher scaffolds, perpetuating a cycle of disadvantage. SRL is indispensable for online learning success, but the supporting relationship between metacognition and online student engagement, and how to foster online student engagement in terms of self-regulation are worth studying.

In sum, motivation, self-efficacy and self-regulated learning ability are three core pillars constituting the psychological engagement system of online learners. Within this frame, motivation provides the driving force, self-efficacy offers confidence support, and SRL provides the management framework to transform motivation and confidence into sustained action. The structural characteristics of online learning (high autonomy, technology mediation) make them extremely important. However, this internal engine does not run in a vacuum. Its performance is fuelled or reshaped by a series of external ecological supports that constitute the online learning environment.

2.3.2 External Ecological Factors as Multi-level Enablers

Online student engagement does not exist in isolation. Rather, it is embedded in a complex and multi-layered social ecosystem. This study defines external ecological factors as the multi-level supports operating through teachers, peers, families and institutions. These factors can collectively constitute supportive learning community which aids students' online learning experiences. The concept of student engagement has evolved to recognize its environmental embeddedness. Appleton et al. (2006) established a foundational framework identifying three primary contexts: peers, family and school. This view was later expanded by Mahatmya et al. (2012), who asserted that engagement "is situated within a set of overlapping and multifaceted environmental systems such as the home, school, neighbourhood, and larger sociohistorical context that also interact to shape development" (p.49). This ecological framing usefully discourages conceptualizing student engagement as not simply an individual trait or a product of traditional teaching, but rather a socially constructed outcome shaped by layered social interactions. Thus, it is continuously co-constructed through intersecting social environments that can either foster or limit meaningful engagement, thereby reflecting a broader ecological perspective.

1) Teacher Support as a Contingent Facilitator of Engagement Pathways

Teacher support does not have a universal and consistent effect on online student engagement or learning outcomes. Instead, its impact is contingent and conditional, depending on specific contextual, student-related or pedagogical factors. While teacher support is widely recognized as a key predictor of students' behavioural, emotional and

cognitive engagement (Wang & Eccles, 2012; Saidin et al., 2020), with consistent links to positive learning outcomes (Boatman, 2016), the mechanism through which support operates is far more complex than simple provision.

Scholarship strongly affirms the centrality of instructor-related factors. A review by Yam and Christopher (2025) further highlights that instructor variables were a focal point in 17 studies examining student engagement in online learning during the COVID-19 pandemic, underscoring their critical role. These factors manifest in several interconnected dimensions. Teacher competencies, including self-efficacy, digital skills and technical readiness, directly shape engagement. Teachers' self-efficacy, defined as their preparedness and confidence in delivering course content, along with their digital proficiency (Aldhaen et al., 2024) and comfort with learning technologies (technical readiness), significantly impacts student engagement (Maini et al., 2021). The pandemic intensified this dynamic, making the quality of teacher support not just relevant, but decisive in determining the success of online learning environments. In the meanwhile, such a narrow, technical conceptualization of teacher support may obscure the broader organizational and systemic contexts that shape online teaching and learning.

However, a critical examination of the literature reveals that the influence of teacher support is not universally positive or straightforward. The dominant narrative, often framed by models such as the Community of Inquiry (CoI), appropriately emphasizes "teaching presence" and "quality interaction" as crucial (Arsenijević et al., 2022; Akram & Li, 2024). This perspective may overlook the fact that well-intentioned support can be perceived as controlling. The key finding by Han et al. (2021), where teacher support had no significant or even a negative impact on engagement in a Chinese EFL context, challenges the assumption of its universal positivity. Similarly, in a study of international students learning Chinese online, Fan & Tian (2022) found that while students highly recognized the teacher support they received, this support did not significantly affect their online academic performance. These findings suggest that in high power-distance cultures or high-stakes learning environments, increased teacher direction can be experienced as pressure, which undermines student autonomy and intrinsic motivation. The issue, then, is not how much support is offered, but what kind. Support that promotes autonomy yields

very different results from support that exercises control.

A further limitation in the current literature is its tendency to treat "teacher support" as a single, homogenous concept, ignoring the alignment of its sub-dimensions. In practice, it includes multiple and distinct dimensions such as digital competence, emotional support and instructional design (Lim et al., 2022; Luan et al., 2023). The overall impact on engagement depends on the alignment of these dimensions. For example, a teacher with high technical proficiency but poor feedback quality may have a neutral or even negative overall effect. The positive correlations found in studies like Akram & Li (2024) likely reflect cases where these dimensions are aligned and effective. When results are weak or contradictory, it often signals a breakdown in alignment: strengths in one area cannot compensate for deficits in another. This points to a more complex reality: support is not simply present or absent, but variably constructed. Moreover, it is only as effective as its weakest link, rendering the construct contextually fragile.

A further critical limitation in the literature is the context in which much pandemic-era research on Emergency Remote Teaching (ERT) took place. The intense focus on teacher support during this crisis may reflect its role as a necessary stabilizer in a disrupted environment rather than its optimal function in a well-designed, sustainable online course (Jayatha, 2022; Ciudad et al., 2023; Salta et al., 2022; Bozan et al., 2024; Liu, 2017; Shea, 2009). When instruction was abruptly shifted online, teachers became lifelines, filling gaps left by underdeveloped infrastructure, unclear expectations and widespread uncertainty. However, what works as a crisis intervention does not necessarily translate to a well-structured, sustainable online course. In intentionally online programs, the goal of instructional design should be to foster student autonomy and peer collaboration so that students can succeed without constant instructor mediation. This gives rise to a paradox seldom addressed in the literature: the most effective teacher support in online student engagement may be that which gradually becomes less critical over time by cultivating students' capacity for self-regulation.

Therefore, existing research confirms the potential power of teacher support, but also highlights its conditional nature, which depends on its qualitative style, its

multidimensional balance and the broader instructional context. Effective online pedagogy must move beyond simply increasing support to carefully designing the right kind of support. The support is autonomy-oriented, culturally sensitive and strategically deployed to foster long-term independence rather than perpetual dependence.

2) Peer Support as Collaborative Understanding

Alongside teacher support, the role of peer interaction emerges as another critical dimension of the online learning ecology. Extensive research recognizes peer support as fundamental to successful online learning, highlighting its significant benefits for learners' social, cognitive and emotional engagement. Yet this characterization often shifts toward idealization. Scholars commonly categorize this support into distinct dimensions: emotional or esteem support; tangible or instrumental aid; informational support such as advice and feedback; and companionship that fosters a sense of belonging (Yusriani et al., 2023). The framework is foundational to a prevalent narrative that idealizes peer interaction, presenting it as an unambiguous positive and a social remedy for enhancing self-efficacy, well-being and academic outcomes (Yang et al., 2021; Huang & Wang, 2023; Deep & Chen, 2025). Yet this idealization deserves a closer look. While peer support can be changeable, the change does not happen automatically nor positively for every student. Without careful design, peer interactions often remain superficial and lack real depth.

The theoretical mechanisms for these positive effects of peer support are heavily rooted in Bandura' (1986) Social Learning Theory. The argument follows that in online settings, students build confidence and competence by observing and emulating the successful strategies of their peers, thereby strengthening their own technical and academic skills. Furthermore, collaborative activities like group projects and discussion forums are seen as essential for cultivating a culture of mutual respect and shared purpose, a culture that Robinson Jr. (2025) argues "upholds the legitimacy" of the online learning experience itself. However, a critical examination reveals that this optimistic narrative often overlooks significant complexities and potential drawbacks. The very mechanisms supposed to help students can also increase inequalities. Smith and MacGregor (2022) emphasize that without intentional facilitation, high-achieving students often control the pace and

direction of online collaborative activities, leaving less confident or lower-performing students behind. Similarly, group work designed to make everyone feel included can have the opposite effect on students who are shy or learn differently. These students may feel pressured to act "engaged" in a certain way to fit in, which can make them feel more isolated. Even worse, mandatory collaboration can become a source of stress rather than support. Students who are introverted, time-poor, or simply prefer independent study potentially increase their anxiety rather than reduce it. As such, findings like Huang's (2025) on the link between peer support and enjoyment likely apply only to those already comfortable in interactive settings, but leaving others uncared and unsupported.

Therefore, peer support is not a self-activating but a contingent process, and its benefits are far from automatic. Its success is highly contingent on deliberate instructional design and skilled facilitation. The role of the instructor becomes more, not less, critical in an environment reliant on peer dynamics. Effective implementation requires instructors to model constructive feedback, monitor group dynamics for equity, provide clear structures to prevent social loafing, and create multiple pathways for engagement that respect diverse participation styles. Ultimately, peer support is a powerful but complex tool whose value is determined not by its mere presence, but by the thoughtfulness of its integration into the online learning ecosystem.

3) Family Support as an Ambivalent Resource

If peer interactions form one layer of the social ecosystem, the family environment provides another, often more intimate, layer of influence. A substantial body of research confirms a strong, positive correlation between family support and student engagement, a relationship that is multifaceted and critical for academic success. This connection became particularly salient during the COVID-19 pandemic, as lockdowns forced learning into the home, fundamentally altering the educational landscape and placing families at the forefront of academic support (Baroudi & Shaya, 2022). The beneficial impact of family support operates through several distinct channels. Wirawati and Awalin (2023) specify that support manifests in informational, emotional, rewarding and instrumental forms, all of which directly shape academic outcomes. Their research, focusing on online learning

during the pandemic, found a significant correlation between these forms of family support and students' semester achievement index. Beyond direct academic outcomes, family support is also a key driver of learning motivation. As demonstrated by Rasyida and Hakim (2022), family support, in conjunction with a student's self-concept, exerts a very significant positive influence on the learning motivation of junior high school students, underscoring its role in fostering the psychological willingness to engage in learning. The emphasis on "positive influence" risks obscuring the potential downsides of this dynamic, as the underlying mechanisms may be more complex.

Empirical studies further elucidate how family support translates into observable engagement, especially in remote learning environments. Yet this conversion process is rarely as direct as the literature implies. Baroudi and Shaya's (2022) qualitative analysis identified parental involvement as a critical factor for success in online teaching. They found that engaging parents was essential for ensuring regular lesson attendance and maintaining student presence, particularly in contexts where the lack of visual cues (e.g., cameras being off) increased risks of disengagement and misbehaviour. Their findings position family support as a direct antecedent to positive study habits and behavioural engagement. This perspective may fail to acknowledge that such involvement, however well-intentioned, can easily lead to intrusive monitoring and generate undue pressure.

However, the degree and nature of this influence are not uniform across all student populations. Research indicates that the effect of family is more pronounced for certain demographics. For instance, Tian and Hye (2024) and Zhu (2022) note that for vocational and secondary school students, family social networks and relationships exert a stronger influence on their engagement compared to university students. They argue that more harmonious family relationships correlate with higher levels of cognitive, emotional and behavioural engagement. This suggests that an optimal growth environment is often associated with a moderate level of family socioeconomic capital. Consequently, students from both highly disadvantaged and affluent backgrounds may require specific attention, as their engagement is differentially affected. Crucially, the nature and effectiveness of family support are not merely functions of economic resources but are fundamentally shaped by cultural background, values and aspirations.

Finally, the literature confirms that family support does not operate in a vacuum but interacts with other microsystems in a student's life. Xie et al. (2025) demonstrated that during home-based online learning, both the family environment and teacher autonomy support were positive predictors of student engagement. This suggests that the family and school work cooperatively to enhance learning engagement. While these results underscore that a comprehensive understanding of how to optimize student engagement requires accounting for all influential ecosystems, this interpretation risks presenting a harmonized view of ecosystem interactions. Thus, this holistic perspective is essential for developing effective interventions tailored to remote or hybrid learning environments.

4) Institution Support as the Mediator of Macrosystemic Mandates

Beyond the immediate social circles of peers and family lies the formal structure of the educational institution itself. Bronfenbrenner's ecological systems theory positions the macrosystem as the predominant layer of cultural values, laws and governmental resources that exerts influence across all other levels of a child's environment (Berk, 2000; Perera, 2023). This review analyses how key components of this macrosystem, specifically educational institutions and national government bodies, shape the dynamics of online and distance learning. The evidence suggests that while institutional support is a crucial factor for student engagement, its actual form, quality and effectiveness are not institutionally self-determined; instead, they are fundamentally directed by distal macrosystemic policies, resource distribution and cultural priorities.

At the institutional level, research consistently demonstrates a direct correlation between support structures and key learning outcomes. The mechanisms of this influence are multifaceted. For instance, Khong et al. (2024) frame this through the Community of Inquiry model, finding that perceived institutional support enhances online learning satisfaction by strengthening students' social competencies with peers and instructors. This aligns with Tufail's (2024) finding that institutional support is moderately interconnected with students' learning needs and assessment experiences, underscoring its role as a foundational element of the learning environment. However, a critical limitation of these studies is their focus on correlation and perception. They stop short of causally

demonstrating which specific institutional actions are most effective in actually strengthening sustained online engagement.

Moving beyond measures of satisfaction, the literature indicates that institutional characteristics are powerful drivers of student engagement. In a significant finding, Tian and Hye (2024) demonstrate that for secondary vocational students, school-level factors exerted a greater influence on cognitive, behavioural and emotional engagement than individual or family characteristics. This challenges the common emphasis on individual student motivation and highlights the institution's primary role, reframing the institution not as a backdrop but as an active determinant. Wang (2025) provides a valuable framework for understanding this influence, categorizing institutional interventions into five tools: authority, incentive, capability, symbolic and learning. This framework is a critical advancement, as it moves from simply noting an association to proposing a typology for how institutions can actively facilitate engagement. Yet a critical gap remains, however, in quantifying the relative effectiveness of these different tools across diverse student populations.

Ultimately, institutional action is not isolated; rather, it is both restricted and facilitated by the wider macrosystem, especially national policy. This hierarchical relationship was starkly evident during the COVID-19 pandemic. National directives, such as the Chinese Ministry of Education's mandate to "suspend classes without suspending learning", created the necessary conditions for a rapid, system-wide shift to online education. In this context, institutional adaptations, such as adjusting grading policies and extending deadlines, were direct responses to macrosystemic crises and guidelines. This reveals a critical hierarchy of influence: the macrosystem sets the stage, and institutions (universities) act upon it. Therefore, this review argues that institutional support alone determines engagement are incomplete; it is more accurate to view institutions as the mediators of macrosystemic values and mandates.

In sum, the literature consistently establishes that institution support in the form of IT infrastructure, pedagogical frameworks and policy flexibility is a vital predictor of online student satisfaction and engagement. Yet, a critical synthesis reveals that this influence

does not operate in isolation. The institution's capacity to act is largely shaped by the resources, priorities and legal structures emanating from the national macrosystem. Future research should, therefore, adopt a more integrated analytical lens, investigating not only the presence of institution support, but also how its efficacy is modulated by the specific macrosystemic context in which it is embedded. This would provide a deeper understanding of how to build resilient and effective online learning ecosystems.

5) Technology as the Mediating Infrastructure

The role of technology in shaping student engagement in higher education is complex and multifaceted, extending far beyond its function as a simple delivery mechanism. A critical synthesis of recent literature suggests that technology is not just a passive tool in education, but an active participant in shaping the learning experiences. The mediating factors that influence online student engagement range from digital environments to students' willingness to make use of them. This review argues that technology can enhance engagement, but its success depends on equitable access, pedagogical design and the socio-technical context of the learner.

The most basic technological influence on engagement is objective access and functionality. Research consistently identifies that stable internet connectivity, reliable platform performance and adequate hardware form a non-negotiable foundation for participation (Ng et al., 2022). The COVID-19 pandemic starkly highlighted this "infrastructure layer", as disparities in access to these resources directly created inequalities in learning experiences, effectively locking disadvantaged students out of engagement (Yam & Christopher, 2025). Yet, access alone does not really guarantee engagement due to uninspiring design or a lack of instructional support. Digital tools can facilitate active learning through diverse teaching approaches and streamlined communication (Pinto, 2020), but their potential is hollow if the underlying infrastructure is missing or unstable. Although access and functionality are clearly essential, viewing them as the main or ultimate factor in how technology affects engagement overlooks the complex interplay of design, pedagogy and fairness that ultimately determines whether technology serves as a bridge or a barrier.

Once basic access is assumed, the literature shifts focus to a "proficiency layer" involving users' subjective experiences and skills. Drawing on models like the Technology Acceptance Model (TAM), studies demonstrate that students' behavioural, cognitive, and emotional engagement is strongly correlated with their perceived ease of use and perceived usefulness of the learning systems (El-Sayad et al., 2021; Fabian et al., 2022). This points to a more human truth: technology only facilitates learning when it feels intelligible, manageable and purpose-aligned to the learner. Otherwise, even the most well-designed system becomes a barrier, not a bridge. This suggests that engagement is not driven by the tool's features alone, but by the student's belief that the technology effectively supports their learning goals.

The interplay between these layers is not universal but is entirely contextual, a point illuminated by apparently contradictory findings. The discrepancy between Deka's (2021) study in an Indian context, which found that technical support had no significant link to engagement, and Wang et al.'s (2021) emphasis on "digital competence" is not a simple conflict but a key to understanding. It suggests a critical hierarchy of needs: for students in contexts where basic access is a primary struggle (as in Deka's study), higher-order factors like perceived usefulness are largely irrelevant. In contrast, in technologically saturated environments (implied in Wang et al.'s study), technology is the assumed medium, and competence with it becomes a prerequisite for engagement. This contrast underscores that technology's role is profoundly shaped by socioeconomic context and prior socialization.

The above literature confirms that technological factors are critical to online student engagement. However, it also reveals that technology is a political and pedagogical actor, rather than a neutral tool. The inherent biases and built-in pedagogical assumptions of the system can shape the learning experience to favour certain styles of interaction over others. Therefore, the goal should not be the indiscriminate integration of more technology. Instead, the challenge is to ensure that technology serves a pedagogy of deep engagement. This can be achieved by first guaranteeing equitable access, then consciously designing learning experiences that utilize tools based on explicit pedagogical values, and critically evaluating their impact to avoid favouring superficial participation. The critical goal is to master technology as a tool for teaching, ensuring it serves pedagogy rather than dictates it.

While the technological factors provide the structural foundation, it is the social dynamics operating through this technological infrastructure that ultimately determine the depth and sustainability of online student engagement. Consequently, the analysis shifts from the mediating role of technology to demographic variables that serve as contextual moderators.

2.3.3 Demographic Variables as Contextual Moderators

While variables like gender, age and academic year are frequently investigated as predictors of student engagement, the empirical evidence reveals that their influence is neither consistent nor universal, but rather profoundly shaped by context. A review of the literature confirms this complexity, demonstrating that demographic factors do not simply determine outcomes; instead, their influence is shaped by institutional culture, learning environment and personal experiences of individual learners.

The literature on gender differences in online engagement exemplifies this conceptual complexity. While some studies report higher engagement among female students, particularly in collaborative or communication-rich online tasks (Wu & Teets, 2021; Li et al., 2023; Banihashem et al., 2021), others have found male students to be more engaged (Owusu-Agyeman et al., 2021). This contradiction is not a data error, as it reflects the deeper truth that gender's influence on engagement is not fixed, but shaped by context, task design and social dynamics. Similarly, academic year or grade level has been shown to correlate with varying patterns of engagement. For instance, second-year students have exhibited different engagement profiles compared to third-year students (in Limbu & McKinley, 2024), and senior students have demonstrated higher levels of emotional engagement relative to first- or second-year students (Salta et al., 2022). In contrast, first-year students have often been reported to exhibit lower overall engagement, particularly during transitional phases in their academic programs (Wu & Teets, 2021). Collectively, these mixed findings challenge the value of static demographic typologies, such as gender and academic year, as predictors of engagement. A deeper understanding is needed of how gender and academic year intersect within the lived experience of learning.

These inconsistent and context-specific findings make one thing clear: demographic variables cannot be treated as linear predictors of success. Their influence shifts depending

on institutional context, cultural background and individual learner characteristics. This means the relationship between demographics and engagement is neither stable nor universal, underscoring the need for context-sensitive interpretations in engagement research. As such, while demographic variables are relevant to consider, their differential impact necessitates careful analysis within specific educational and cultural settings.

To conclude, this multi-level list of factors, while informative, risks oversimplifying engagement as a static, additive outcome rather than a dynamic, interactive process. The field is strong on identifying what is related but weak on explaining how and why these factors interact. There is a clear need for studies that model the interdependencies and relative weights of factors, not just their presence.

2.4. The Dynamic Ecosystem of Online Student Engagement

The preceding literature indicates that both internal and external factors interact dynamically to sustain online student engagement. The relationship between influencing factors and engagement dimensions is characterized by a complex, interdependent dynamic rather than a linear cause-effect mapping.

Specific factors tend to exert a primary influence on one dimension while simultaneously supporting others, thereby forming an integrated ecosystem. For example, cognitive engagement is predominantly driven by course design and instructional quality, yet also fuelled by learners' internal readiness, such as self-efficacy (Deka, 2021; Li et al., 2021; Huang & Wang, 2022; Jayanthi & Rajalakshmi, 2022). Behavioural engagement is activated by external structures such as instructor guidance but sustained by internal characteristics like motivation and autonomy (Deka, 2021; Wang et al., 2022; Li et al., 2021; Huang & Wang, 2023; Azhari et al., 2022; Huang, 2023). Affective (Emotional) engagement is fundamentally nurtured by relational and supportive factors. A positive emotional state is closely tied to the satisfaction of relatedness needs, fostered through instructor rapport, peer support, and a sense of community belonging (Huang & Wang, 2022; Yang J et al., 2021). Social interaction exemplifies this synergy, requiring the integrated input of cognitive (thoughtful communication), behavioural (active contribution),

and affective (positive affect) dimensions to be effective (Ciudad et al., 2023). A dominant trend in the literature is to catalogue external, often technical, supports, such as platform stability or instructional clarity, while marginalizing the complex interplay of social, emotional, and relational variables (Fu & Chen, 2023). A holistic understanding of online engagement must account for this network of psychological and social supports that dynamically enable or constrain the engagement process.

Crucially, however, the specific pathways and strengths of these connections remain inadequately understood. Although the conceptual link between external supports and internal self-regulation is widely acknowledged, empirical research seldom quantitatively models how external factors dynamically shape internal processes, or how those processes, in turn, moderate the effect of external conditions. This measurement gap limits our ability to predict which interventions will most effectively sustain engagement across diverse learners and contexts.

This interconnectedness confirms that online engagement operates as a dynamic system, in which influencing factors create ripple effects across multiple dimensions, highlighting the need for more integrated, systemic research and intervention designs.

2.5 Methodological Consideration in Framing Online Student Engagement

As outlined in Section 2.4, the measurement gap preventing effective linkage between internal and external factors creates a persistent methodological challenge. Furthermore, attempts to define and unpack the multifaceted environmental predictors of student engagement expose an additional key methodological constraint: the inherent difficulty of empirically evaluating authentic engagement mechanisms within online learning contexts.

1) Epistemological Constraints of Self-Report Scales

Self-report scales constitute the dominant epistemological lens for measuring Online Student Engagement (OSE), offering direct insight into learners' perceived cognitive, emotional and behavioural engagement. Scholars have developed numerous validated

instruments, such as the National Survey of Student Engagement (NSSE) (Zilvinskis et al., 2017), the Student Engagement Instrument (SEI) (Appleton et al., 2006), the Higher Education Student Engagement Scale (HESES) (Zhoc et al., 2019), and the Online Student Engagement Survey (OSSES) (Dixson, 2010), which are widely used to assess educational environments. However, most established scales focus on basic or general higher education, often failing to capture the domain-specific mechanisms inherent in specialized contexts like university language learning.

In response to the recognized need for contextual sensitivity, many researchers (Sun & Rueda, 2012; Fidan & Uslue, 2023; Akram & Li, 2024) have developed or adapted scales for specific online learning environments and populations. Examples include the MOOC Engagement Scale (Deng, 2020) and instruments designed for particular demographic groups, such as Chinese non-English majors. Recent efforts, like the comprehensive scale developed by Xu and Qiu (2025) for online English learning in China, illustrate attempts to address complexity within a defined setting. While this proliferation yields ecologically valid tools for specific contexts, it also results in a fragmented landscape of instruments. More importantly, the field lacks a universally accepted core framework.

Scales vary significantly in their prioritized dimensions, some emphasizing social interaction, others agency, reflecting differing theoretical lenses and the context-sensitive nature of engagement itself. This variation underscores a fundamental challenge: while self-reports access essential internal states, their inconsistency hinders comparative synthesis.

2) Behavioural Analytics as Indicators of Engagement Processes

To offset the limitations of the epistemological constraints of self-report, researchers increasingly employ behavioural and learning analytics as objective indicators of engagement. The rise of online learning platforms generates extensive log data (e.g., login frequency, page visits, video interactions, forum posts), enabling the objective, real-time tracking of behavioural engagement. Researchers analyse these digital footprints to measure indicators like participation, persistence, and regularity. For instance, some scholars (Li et al., 2020; Wang et al., 2019) use posting frequency or response rates to

gauge interaction in collaborative learning.

While these methods provide ecologically valid evidence of *what* learners do, they suffer from a critical interpretive gap: they function as proxies for latent engagement processes without revealing the generative mechanisms driving them. Behavioural data can confirm that an action occurred, but it cannot elucidate the *why*, the underlying motivations, the cognitive depth or the affective experiences behind the actions. As Torre Franca et al. (2025) caution, meaningful engagement is inextricably tied to pedagogical design and qualitative experience, dimensions that analytics alone cannot fully capture.

3) Critical Tensions in Capturing Subjective Experience

While qualitative inquiry is indispensable for accessing the subjective texture of engagement, its application exposes fundamental epistemological tensions regarding objectivity, scalability and theoretical coherence. The reliance on coding schemes, whether applied to text, discourse, or video, inherently introduces researcher subjectivity. For example, Eunjung Grace Oh et al. (2016) coded audio-recorded debates based on Bloom's taxonomy of cognitive learning, encompassing knowledge, comprehension, application, analysis, synthesis, and evaluation, to analyse participants' levels of thinking skills. Frameworks like Bloom's taxonomy or categories like "deep" vs. "surface" engagement are themselves theoretical constructs; their application is an interpretive act that shapes what is recognized as engagement, potentially overlooking culturally or contextually specific manifestations.

Furthermore, the methodological strength of qualitative depth remains unsolved. The intensive, manual labour of coding limits analysis to small samples, raising persistent concerns about generalisability. The common assertion that qualitative methods are a "useful complement" to other data often masks a deeper methodological tension: it attempts to bridge subjective experience and observable behaviour without a unified theory of how these dimensions interact (Johar et al., 2023). Consequently, mixed-methods approaches risk becoming a simplistic triangulation of data points rather than a genuine theoretical synthesis.

Rather than sidestepping these limitations, this study deliberately engages with these critical tensions by employing Reflexive Thematic Analysis (Braun & Clarke, 2006, 2019, 2020). Far from a neutral tool, Reflexive Thematic Analysis (RTA) provides a framework whose core tenets directly address the noted critiques. It rejects a positivist pursuit of a singular truth, instead embracing qualitative research as an interpretive process. Researcher subjectivity is treated not as a flaw, but as a reflexive resource for generating situated understanding. Consequently, themes are not extracted via a pre-set codebook, but are actively developed from the data to capture contextually salient meanings. This approach is designed to surface detailed, and potentially context-specific, manifestations of engagement that standardized schemes may overlook. Thus, rather than bypassing methodological tensions, the study engages them directly, using Reflexive Thematic Analysis to produce a coherent, critically self-aware account. By foregrounding theoretical reflexivity, this study produces an account that not only describes experience but also critically interrogates the mechanism of its possibility.

4) Toward an Integrated Methodology for Understanding OSE Mechanisms

The foregoing analysis shows that the diversity of approaches surrounding online student engagement (OSE) is not merely a matter of researcher preference, but a feature of the construct's multi-layered complexity. The pressing challenge, therefore, is not a shortage of methods but a need for strategic integration to achieve mechanism clarity. Future research must develop coherent frameworks that deliberately combine these diverse data types, linking the subjective *why* of self-report with the objective *what* of analytics. Such an integrated approach is essential for building a more robust and holistic understanding. By combining a targeted self-report instrument with Reflexive Thematic Analysis, it seeks to bridge the gap between perceived internal states and observable actions.

2.6 Synthesis of the Literature and Identification of Research Gaps

As the preceding sections have demonstrated, from the conceptual evolution of engagement (Section 2.1), through the application of educational ecological theory (Section 2.2), to the empirical fragmentation of multi-level determinants (Section 2.3), scholarly attention to online student engagement has expanded considerably. While

scholarly attention to online student engagement has expanded considerably, the literature on College English online teaching remains constrained by persistent research gaps and, more importantly, by underlying theoretical limitations. These gaps reflect three interrelated dimensions of contextual, theoretical and systemic weaknesses that limit the scope of inquiry, resulting in an incomplete understanding of how online student engagement operates within this specialized educational context.

2.6.1 The Contextual Contingency Gap

A critical theoretical and empirical gap, herein termed the contextual contingency gap, persists in scholarship on online student engagement. Existing conceptualizations of engagement are largely derived from Western, low-stakes or face-to-face educational contexts (Section 2.1). Yet, their validity and operational relevance in distinct, high-stakes settings remain under examined. This gap demands systematic research that examines how established frameworks adapt to the context specific to pandemic-era College English online teaching in China. It serves not merely as an empirical setting but as a stress test for the portability of dominant engagement frameworks. In this setting, pedagogical traditions and learning orientations differ significantly from those in Western paradigms. The unique educational ecosystem is shaped both by macro-level policies, such as the national "suspending classes without suspending learning" initiative (Ministry of Education of the People's Republic of China, 2020), and by micro-level interactions among students, teachers and peers. Moreover, the combination of language-specific challenges, such as foreign language anxiety and the need for authentic interaction, and the constraints of online delivery highlights the urgency of targeted investigation.

2.6.2 The Theoretical Integration Gap

A fundamental theoretical integration gap underlies the previously identified empirical shortcomings: no existing interactive framework systematically connects external ecological contexts, social-cognitive processes and constructivist online learning interactions. Despite the utility of ecological systems theory outlined in Section 2.2, most models such as Kahu's (2013) and Fredricks' (2004) were built for offline or blended learning and remain poorly adapted to online settings, which feature prominent

self-regulation demands and fewer interpersonal cues (Sun et al., 2025; Salta et al., 2022; Nia et al., 2021). While these frameworks separate distinct engagement components, they overlook their causal and structural connections. Meanwhile, studies on pandemic-related OSE suffer from theoretical fragmentation (Section 2.2.1), as researchers tend to analyse individual, technological and social factors separately. Collectively, these issues hinder targeted, evidence-based interventions for College English online teaching. This study thus develops an integrated theoretical framework that integrates a core theory with supplementary constructs, offering a comprehensive multi-level explanation of learning engagement (Section 2.2.2, Section 2.2.3).

2.6.3 The Holistic Interaction Gap

Building on the fragmented analysis of internal and external factors identified in Section 2.3, this study defines another critical gap as the holistic interaction gap. Current literature tends to examine dimensions of online student engagement in isolation, often relying on single-factor analyses, such as the distinct impact of technology or teacher support (see Section 2.3.2). This fragmented approach has hindered the development of comprehensive empirical models capable of capturing the dynamic and reciprocal interactions among the core engagement dimensions (behavioural, cognitive, emotional, and social) and the key support factors that influence them (e.g., student self-support, teacher support, peer support, family support, and institutional support). As a result, there is limited understanding of how these supporting factors differentially affect each engagement dimension, or how they may interact in combination (Section 2.3.2). This gap is particularly problematic because online student engagement functions as a dynamic system, where changes in one dimension or support factor can trigger a chain reaction across others. Yet the existing literature provides limited insight into how the relative importance of different levels within the ecological system is reshaped under external pressures (Section 2.4), and the structural relationships among self-efficacy, motivation, and self-regulation remain to be fully clarified (Section 2.3.1).

Existing research gaps provide a compelling rationale for further investigation, a need further amplified by the unique disruptions of the pandemic-era shift to Emergency Remote Teaching (ERT). Engagement in such online settings differs significantly from

traditional classrooms due to factors like technological mediation and heightened student autonomy. However, current research on Online Student Engagement remains limited by fragmentation and a lack of contextual depth. In response, this study is justified in its focused examination of online student engagement.

To address these limitations, this research adopts a multidimensional approach within an ecological systems framework. It aims to explore the complex interplay of factors shaping engagement in College English online courses. Central to this investigation is the argument that online student engagement, conceptualized through behavioural, emotional, cognitive and interactive dimensions, is dynamically shaped by the complex synergy of individual, instructional, technological and social factors within its ecological system. By mapping these engagement patterns and their influencing conditions, the study seeks to address a critical gap in the literature concerning context-specific online foreign language learning, while also generating practical insights for enhancing post-pandemic online language education.

In summary, this literature review has systematically charted the evolving landscape of online student engagement, with particular attention to its relevance for pandemic-era College English teaching in China. A critical synthesis identifies three interconnected gaps that hinder a comprehensive and context-sensitive understanding of OSE. Collectively, these gaps underscore the necessity of a research approach that marries theoretical rigor with contextual specificity. Consequently, the subsequent chapter details the research methodology designed to address these limitations.

Chapter 3 Methodology

This chapter presents a comprehensive account of the research design and methodological framework employed in the study. It begins with the restatement of the primary research questions, followed by a detailed description of the participants profile, sampling strategy, research instruments and the procedures used for data collection and analysis. It pays attention to the application of statistical tests to assess reliability and validity of the measurement tools. Furthermore, the chapter justifies the adoption of a mixed-methods approach which combines both qualitative and quantitative methods to achieve a deeper understanding of the research problem. Finally, it describes the pilot study procedure, highlighting its role in refining the survey instruments prior to the main data collection phase.

3.1 Research Questions in Detail

Based on the preceding review of literature and theoretical framework, this study proposes the following research questions:

Research Question 1:

What are the perceptions and experiences of Chinese College English students regarding their online engagement across behavioural, cognitive, affective and interactive dimensions during the pandemic? How do the levels of engagement in these dimensions differ according to students' gender, academic major and year of study?

Research Question 2:

What is the relationship between multi-layered support factors (self-support, teacher, peer, institutional and family support) and online student engagement? To what extent does each support factor uniquely predict the different dimensions of engagement?

Research Question 3:

What intrinsic mechanisms underpin Chinese College English online student engagement, and how can understanding these mechanisms inform strategies for sustainable development in online teaching?

From an ontological standpoint, Research Questions 1 and 2 aim to explore the nature of online English learning environments by examining students' perceptions and experiences of engagement, as well as identifying key influencing factors. Data collected through Question 1 and Question 2 will enable to conceptualize and categorize the various variables within College English online teaching context. Moreover, from epistemological viewpoint, Question 2 also addresses how the student construct knowledge and develop skills in an online context, focusing on the interplay between the learning engagement dimensions, such as behaviour, affective, cognition and interaction and external support factors related to them.

Research Question 3 employs a qualitative approach to further uncover the intrinsic and extrinsic factors influencing online student engagement. It seeks to reveal the underlying mechanisms that influence student engagement from both the teachers' and the students' perspectives. Based on the above research, corresponding interventions and strategies are offered.

3.2 Research Subjects

The participants in this study include both students and teachers who took part in College English online teaching during the COVID-19 pandemic at D University. Located in Northeast of China, D University is a mid-tier undergraduate university. The students at D University come from all over China. They share a broadly similar level of English proficiency when compared to the students at other universities of similar standing. This linguistic consistency allows the study to reflect common challenges and patterns in online College English learning across mainstream Chinese universities. By situating the research within this type of university, the findings better reflect the realities, strengths and constraints faced by the majority of students and teachers experiencing online learning during the pandemic period.

3.2.1 The Targeted University

Based on academic and teaching resources, Chinese universities are classified into top-tier, mid-tier, and ordinary universities. Top-tier universities, often referred to as the "985" and "211" projects, are renowned for their excellence in research and education. Mid-tier universities fall between top-tier and ordinary institutions. Ordinary universities represent the broader landscape of higher education in China. According to the latest survey, there are 39 "985 Project" universities and 112 "211 Project" universities in China. More than 1,200 universities are categorized as ordinary undergraduate, including mid-tier universities. (BESTEDUCHINA, 2026).

D University, a mid-tier university, is conducive to data collection and research because of its representativeness in various aspects, including its academic specialties, administrative affiliations, nature, and, more importantly, the characteristics and structure of College English teaching. The research subjects include full-time undergraduate students taking College English from different majors and College English Department teachers. Since the background of the study is during the Covid-19 period in China, the student participants are those who took online College English courses from 2020 to 2023 (from Year 2, Year 3 and Year 4). Teacher interview candidates are selected considering variables such as age, academic title, teaching years and online teaching experience. In total, 9 students and 5 teachers participated in the interview.

3.2.2 Sampling Strategy

The sampling strategy for this study was designed to ensure a comprehensive and representative selection of participants from D University, focusing on undergraduates ranging from second year to fourth year who experienced fully online English learning from late 2019 to spring 2022. The first-year students were excluded as they were still in high school during the pandemic.

For the questionnaire survey, a combination of stratified and ratio sampling was employed. The students' study of Year was used as the sampling frame to ensure the representation of the target population. Stratified sampling ensures better representation than simple random sampling by controlling stratum proportions (Krejcie & Morgan, 1970; Neuman, 2014).

Stratified sampling was used to enhance representativeness. Students were divided into Science (65%), Humanities, Arts and other groups, reflecting the university's science-oriented demographics. Since the majority of students at University D are Science students, direct random sampling could potentially overlook minority groups such as art majors and students from other disciplines.

By stratifying students into four categories (Science, Humanities, Arts and others) and conducting independent sampling within each stratum, the internal variation within each academic group can be effectively controlled. This approach ensures that the sample better reflects the overall structural composition of the student population. Random samples were drawn from each stratum, with 400 from Science (66%), 150 from Humanities (25%), and 50 from Arts/others (8%), to maintain proportional representation (Neuman, 2014). The total sample size of 600 followed Wu's (2010) guideline of ten times the number of questions to ensure validity and reliability.

In alignment with the research objective, purposive sampling is employed to target cases of significant research value, enabling an in-depth exploration of the subjects. In this study, efforts were made to diversify the selection of students and teachers (e.g., teachers' age, professional title, as well as students' year-of-study level, academic discipline, and gender) to obtain rich and varied data and information resources. Qualitative sampling prioritizes strategic focus over representativeness (Mason, 2002). Specifically, participants were selected based on their familiarity with the research topic, including non-English majors and College English teachers from D University who fully experienced online teaching during pandemic. Nine undergraduates (Liberal Arts and Science / Engineering majors from Year 2021-2023) were recruited through college announcements, while five English teachers (varying in age, professional title and year taught) were selected via the College English department.

3.3 Research Instruments

To investigate the dynamics of College English online teaching during the pandemic, this study employs a questionnaire survey and interview as its primary research instrument to

address the research questions.

3.3.1 Questionnaire Survey

To address the first two research questions, namely, mapping the current state of student engagement, identifying its key influencing factors, and quantifying their impact effects, the survey method was adopted as the primary research instrument. The structured nature of a questionnaire is particularly apt for this study, as it facilitates the simultaneous measurement of multiple variables, specifically the four dimensions of online student engagement and their potential predictors. The resulting dataset enables the application of advanced statistical techniques, such as multiple regression analysis, which is essential for modelling the complex relationships and quantifying the unique predictive effects of these factors (Vaus, 2002). This study needs to capture the current situation of College English online teaching during the pandemic. The efficiency of the survey in data collection matches the practical requirement.

The questionnaire used a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree". This format was chosen for its simplicity, balanced response options and low cognitive demand on respondents, making it user-friendly for both participants and researchers. It effectively measures students' perceptions of online engagement, providing sufficient discrimination for analysis. The resulting data supports parametric tests (e.g., correlation, regression) to quantify the relationships between engagement and influencing factors. Prior research has confirmed its reliability and validity (e.g., Fredricks et al., 2004; Reeve, 2013), lending empirical credibility to its application in assessing the complexities of College English online learning.

3.3.2 Interview

While the survey identifies what relationships exist, the third research objective which is to uncover the underlying mechanisms driving online student engagement requires a deeper exploration. To achieve it, semi-structured interviews were employed, as they were needed to gain a deep understanding of how students personally experienced and mentally processed their online College English courses during the pandemic in China (Seidman, 2013). This format offers a crucial balance: it ensures key topics related to the engagement

dimensions and influencing factors are systematically addressed, while the flexibility to probe individual responses allows for the emergence of detailed, unexpected insights (Patton, 2002). Through this approach, the qualitative data serve to show the "why" and "how" behind the statistical trends observed in the survey, such as the mechanisms linking teacher feedback to cognitive engagement or peer interaction to affective investment.

By integrating qualitative interviews with quantitative survey data, the study employs a methodological triangulation strategy to bridge the gap between statistical patterns and human experiences. The breadth of the survey data is complemented by the depth of the interview data, ultimately generating a more valid and comprehensive understanding of the phenomenon (Bryman, 2016). This integration allows the statistical patterns identified in the survey to be interpreted through the rich, contextual narratives shared by participants, ensuring that the findings resonate with their lived realities.

3.4 Data Analysis Methods

To align with the mixed-methods design of this study, data analysis employs a strategy that integrates quantitative and qualitative approaches, ensuring through a synthesized analytical framework that the conclusions are grounded in both statistical rigor and contextual depth. The specific procedure follows an "explanatory sequential design": quantitative data analysis is conducted first to identify broad patterns and relationships, after which qualitative data are used to provide deeper interpretation of the quantitative findings.

3.4.1 Design Logic of the Mixed-Methods Approach

This study adopts a mixed-methods approach with an explanatory sequential design, the essence of which lies in the phased and strategic integration of quantitative and qualitative research. The selection of this design is based on the following three considerations.

First, data triangulation is used to reduce bias and enhance validity by cross-validating findings (Gall & Borg, 2003; Creswell, 2014) across methods, compensating for the limitations of any single approach. For instance, while surveys may show a correlation

between teacher support and engagement, interviews can reveal the specific teaching behaviours that explain it.

Second, combining quantitative and qualitative methods delivers epistemological complementarity (Bryman, 2006) quantitative tools measure observable behaviours and general attitudes, and qualitative analysis captures subjective, unspoken emotional experiences, aligning with this study's goal to examine online engagement statistically and explore its underlying mechanisms.

Third, the unique, multifaceted context of emergency online learning demanded a design capable of both measuring variables at scale and examining their effects in depth. Mixed methods allowed for statistical generalization alongside rich, contextual understanding.

Notably, this study does not merely place quantitative and qualitative data side by side. Instead, the two approaches are meaningfully connected and fully integrated throughout the research process. Quantifiable questionnaire results guide targeted interview sampling, including both typical and atypical cases, while key statistical relationships shape the core interview questions. At the analysis stage, numerical trends and qualitative insights are examined together. This side-by-side comparison lets broader statistical patterns and in-depth experiential explanations support, enrich, and clarify one another.

3.4.2 Quantitative Research

Based on the established theoretical framework, this study first employs a quantitative approach to systematically examine the structural relationships among key variables. A large-scale survey is designed to capture measurable patterns of online student engagement in the context of pandemic-era College English online teaching.

1) Preliminary Preparations for Formal Data Analysis

Before proceeding to the main data collection phase, a series of pilot tests were conducted to ensure that the two questionnaires were psychometrically sound and suitable for the main study. These tests included descriptive statistical analysis, homogeneity tests, reliability assessments (both overall and for each dimension), validity checks and

Exploratory Factor Analysis (EFA). Collectively, these procedures enabled the identification and resolution of potential issues, such as unclear items, poor internal consistency, inappropriate response patterns, or underlying factor structures that did not align with the theoretical framework. By refining the instruments through these pilot tests, their reliability and validity were enhanced, thereby increasing the accuracy and credibility of the data collected in the formal study.

After conducting the pilot study, it was necessary to verify the reliability and validity of the statistical data. A reliability analysis of the formal questionnaire is essential for ensuring measurement validity (Cortina, 1993). The results showed that the Cronbach's alpha coefficients for the entire questionnaire and each of its dimensions were all above 0.80 (Appendix C.1), indicating good internal consistency and reliability. Since multiple linear regression analysis was used to develop the models, validity tests, including assessments of construct, convergent and discriminant validity, were also conducted on the scales. Together, these preparatory and validation procedures reinforced the trustworthiness and analytical strength of the study's quantitative findings.

(1) Structural Validity

It concerns the correspondence of measurement outcomes with the theoretical framework.

Fitting the index	Model fit results (Questionnaire 1)	Model fit results (Questionnaire 2)	Criterion for judgement
χ^2/df	4.502	3.885	<3 is ideal; <5 is acceptable
RMR	0.045	0.029	<0.05 ideal; <0.08 is acceptable
CFI	0.905	0.922	> 0.90 ideal; > 0.80 acceptable
GFI	0.856	0.834	> 0.90 ideal; > 0.80 acceptable
AGFI	0.818	0.801	> 0.90 ideal; > 0.80 acceptable

Table 3-1 Fitting Coefficient of the Two Scales

As shown in Table 3-1, all indexes (χ^2/df , RMR, CFI, GFI, AGFI) of the two scales were within the acceptable range, suggesting the two scales were good measurement models with good fitting degrees.

(2) Convergence Validity

Convergent validity, assessed through Average Variance Extracted (AVE) and Composite Reliability (CR), confirms the relationship between observed and latent variables. Ideal

convergent validity is achieved when $AVE > 0.50$ and $CR > 0.80$.

As shown in Appendix C.2, all latent variables in both questionnaires met these criteria: in Questionnaire 1, four latent variables had factor loadings > 0.50 , $AVE > 0.50$, and $CR > 0.80$; in the support dimension (five latent variables), factor loadings exceeded 0.60, $AVE > 0.50$, and $CR > 0.80$, demonstrating good convergence.

(3) Discrimination Validity

Discrimination validity ensures the questionnaire can distinguish different concepts. The result (see Appendix C.3) showed significant correlations among four online student engagement latent variables and five other latent variables.

2) Descriptive and Differences Analysis

Descriptive statistics (mean, standard deviation, frequency, percentage) were first computed to provide an overview of students' demographic profiles (e.g., gender, grade, prior online learning experience) and the levels of online engagement. As an important data exploration method, descriptive statistical analysis helps reveal the overall characteristics and distribution patterns of the data. Specifically, descriptive statistics were calculated for all primary variables, including the four dimensions of online student engagement—online learning cognitive engagement (OLCE), online learning interactive engagement (OLIE), online learning affective engagement (OLAE), and online learning behavioural engagement (OLBE)—as well as the five potential influencing factors: student self-support (SS), teacher support (TS), peer support (PS), institutional support (IS), and family support (FS). This step was essential for checking data distribution, identifying outliers, and establishing a baseline profile of student perceptions and experiences within the online learning environment, thereby laying a foundation for further inferential analysis.

Differences analysis was conducted to examine whether demographic characteristics significantly influence students' online learning engagement. Participants were undergraduate students from formal higher education institutions. Demographic characteristics examined included gender, age, and year of study, as these were considered

potentially influential; place of origin and family socioeconomic background were excluded. The rationale for conducting differences analysis is twofold. First, demographic factors such as gender, major, and year level may shape how students engage online, and testing these differences reveals group-level variations that can inform targeted interventions. Second, identifying significant demographic differences improves the accuracy of subsequent regression models by ensuring that group disparities are not conflated with the true effects of psychological or contextual factors.

Specifically, independent-samples t-tests were used for binary demographic variables (gender and major), as they are appropriate for comparing means between two independent groups. One-way ANOVA was applied to the variable "year level" (three categories), as it tests whether the means of three or more groups differ significantly. Together, these methods provided a comprehensive picture of how demographic heterogeneity relates to online engagement, thereby informing both theory and practice, while also offering contextual information for understanding the status of College English students in this study.

3) Correlation Analysis

Correlation analysis was used to explore the pairwise relationships between supporting factors and each dimension of online engagement, and to help determining which factors might have the strongest influence on engagement, guiding the selection of variables for regression modelling.

Normal distribution analysis is the premise of studying the correlation of sample variables. Therefore, the P-P plots for each dimension and the five supporting factors in the scales, generated through SPSS 19.0 (as shown in the appendix C.4), were helpful and necessary for the further correlation analysis of the study. This allowed for the normal distribution of all dimensions and supporting factors to be obtained, indicating that correlation analysis could be performed.

4) Multiple Linear Regression Analysis

Multiple Linear Regression Analysis was used to quantify the unique contributions of supporting factors to each dimension of online engagement while controlling for demographic variables. The four dimensions of online student engagement (OLCE, OLIE, OLAE and OLBE) were sequentially used as dependent variables in the regression analysis. Subsequently, a general linear regression analysis was conducted with overall online student engagement as the dependent variable and the influencing factors as independent variables to identify the most significant predictors. The coefficients (β) indicate the change in the dependent variable associated with a one-unit change in the corresponding independent variable, holding other variables constant. The primary objective of multiple linear regression is to estimate the value of a dependent variable based on the values of multiple independent variables, thereby assessing the strength and significance of their relationships.

In the multiple linear regression analysis, it was necessary to verify the F-value, adjusted R-squared, t-values, p-values, VIF, and D-W statistic for each regression model. The t-value tests whether coefficients differ significantly from zero; the larger the absolute value of the t-value, the more significant the coefficient. The p-value determines statistical significance (typically $p < 0.05$). Collinearity was assessed using the Variance Inflation Factor (VIF), with values > 10 indicating severe multicollinearity. The Durbin-Watson (D-W) statistic checked for residual autocorrelation. The coefficient of determination (R^2) measures the proportion of variance in the dependent variable explained by the independent variables, while adjusted R^2 accounts for the number of predictors.

3.4.3 Qualitative Research

A qualitative approach, rooted in constructivist and interpretive paradigms, was carried out in the form of in-depth interviews. Thematic Analysis (TA) was employed to identify emerging themes, providing complementary insights to the quantitative research.

1) Employing Reflexive Thematic Analysis

Thematic analysis was selected as the core method for analysing the interview data in this study due to its flexibility and practicality. This method (Braun and Clarke, 2006) is

designed to identify, analyse, and report patterns (themes) within data. Building on this foundation, the present research specifically adopts the reflexive thematic analysis (RTA) further developed by Braun and Clarke (2019, 2020, 2022) to conduct a systematic analysis. RTA is a flexible qualitative method that systematically identifies patterns and meaningful themes in data such as interviews, open-ended surveys, and written documents. In contrast to rigid, linear analytical frameworks, RTA is inherently interpretive and reflexive. It operates on the premise that there is no single, objective truth in data; rather, themes are constructed through the researcher's active engagement, interpretation, and ongoing reflection. Researchers explicitly acknowledge their background, assumptions, and positionality, treating subjectivity as an integral component of analysis. Meaning is explored within authentic socio-cultural contexts via an iterative, non-linear analytical process.

RTA was selected for the following two reasons:

First, the research questions aim to explore university students' views, perceptions, understandings, perspectives, and motivations regarding online English engagement in the Chinese context—often in connection with their own learning experiences—as well as the factors or social processes that shape the nature and form of online student engagement. These questions align precisely with the kinds of inquiries that RTA is designed to address (Braun & Clarke, 2022).

Second, RTA is consistent with the constructivist epistemological stance of this study, which posits that knowledge and themes are co-constructed through interaction between the researcher and the data, rather than simply discovered. This method is particularly suitable for developing a rich, interpretative understanding of college English students' online experiences, while also explicitly acknowledging the active role of the researcher in constructing themes from the data.

2) Reflexive Positionality in Thematic Analysis

Drawing on the principles of Reflexive Thematic Analysis (RTA), I view themes not as fixed findings waiting to be uncovered, but as interpretive constructions shaped by the

researcher. I also recognise myself as the primary analytical instrument, and approached the entire analytical process as an organic, iterative journey.

As a college English teacher, I acknowledge my professional background inevitably shaped my interpretive lens. I deliberately drew on this insider perspective to add depth to the analysis, while maintaining reflexivity through regular memo writing and critical self-reflection. These practices allowed me to recognise my preconceptions and set them aside where appropriate. As such, the interpretations offered in this study represent one coherent, contextually situated reading of the data, framed by my unique professional and positional standpoint.

3) Using NVivo to Support Reflexive Thematic Analysis

To manage the textual data, NVivo 14 was used as a tool for organization rather than automated analysis. While the software assisted in tagging data features and exploring code relationships, all coding, theme development, and interpretation were conducted manually. Analytical reasoning, decisions, and evolving interpretations were recorded through memoing within NVivo, creating a reflexive audit trail. Essential analysis, including pattern interpretation, theme definition, and narrative construction, was performed through iterative close reading, reflective writing, and diagramming outside the software. This ensured that findings emerged from sustained engagement with the data, not from digital aggregation.

4) Establishing Trustworthiness

To enhance the trustworthiness of the analysis, a coding consistency process was conducted. After I had developed a preliminary codebook, a colleague, a professor with a PhD in English Linguistics, assisted me in conducting a coding reliability check. Familiar with reflexive thematic analysis, he was provided with the research questions, theoretical framework, and the draft codebook. We then independently coded a 15% sample of the dataset. Our subsequent collaborative discussion compared coding decisions, focusing on reconciling interpretations and refining the codebook for greater clarity and applicability.

This process prioritized interpretive scrutiny and analytical refinement over statistical consensus. I then completed the full analysis using the revised codebook.

5) The Procedure of RTA

According to Braun and Clarke (2006), there are six-stages in thematic analysis:

(1) Familiarization with the Data

The first stage involved examining and familiarizing myself with the data from interviews conducted with students and teachers. Once the interviews were completed, the recordings were transcribed using Tencent Meeting's transcription feature, and the resulting texts were verified for accuracy against the original audio. This transcription process offered an initial opportunity for familiarization with the data. Deeper immersion was then achieved through active, repeated reading of the transcripts to develop a thorough understanding of the content and pre-coding process.

(2) Generating Initial Codes

I then engaged in systematic, data-driven coding of the entire dataset. Using a primarily inductive approach, I generated concise codes that captured meaningful features relevant to the research question. This was an iterative process, where I revisited and refined codes. Systematically organizing interesting features of the data into concise labels (codes) across the entire dataset. Coding can be both *semantic* (explicit, surface-level meaning) and *latent* (looking for underlying ideas, assumptions).

(3) Searching for Themes

I collated all codes and analysed them for broader patterns of shared meaning. Through a recursive process of sorting, clustering, and reviewing, I constructed initial candidate themes that captured the essence of multiple codes. a theme (Braun and Clarke,2006) is a theoretical construct that explains similarities or variations across codes. It captures something important about the data in relation to the research questions and represents some level of patterned response or meaning within the dataset. Thus, the "keyness" of a

theme is not necessarily dependent on quantifiable measures but on whether it captures something important in relation to the overall research question.

(4) Reviewing Themes

The review process was my quality check for the themes. I took the candidate themes and rigorously tested them in two ways. First, I checked if each theme truly held together internally by reviewing all the data I had grouped under it. Then, I took a step back and reviewed the entire dataset with the themes in mind, actively looking for anything I'd missed or that didn't quite fit. This critical, back-and-forth work, where I split, merged, and refined the themes, was crucial. It ensured the final framework wasn't just a neat story, but a solid and trustworthy interpretation that did justice to the complexity of the data.

(5) Defining and Naming Themes

I then undertook a rigorous phase of reviewing and refining the candidate themes. This process involved evaluating the internal coherence of each theme against its supporting coded extracts, as well as assessing its validity and distinctiveness across the entire dataset. Following this, I clearly defined and named each theme to articulate its core conceptual essence. In the final stage, the themes were aligned with the underlying Online Student Engagement (OSE) framework. This involved interpreting and organizing the themes into the established OSE dimensions, thereby mapping the thematic findings onto the study's core constructs of influencing factors and inherent mechanisms.

(6) Producing the Report

The final step involved weaving the refined themes into a coherent analytic narrative for the findings chapter, selecting vivid and compelling data extracts to illustrate the substance of each theme.

The use of RTA in this study is highly appropriate and agrees well with the research goals and the nature of the research questions. As advocated by many qualitative methodology scholars, RTA enables themes to be actively constructed by researchers through interpretive engagement with the dataset, which is essential for bridging the gap between

theoretical frameworks and empirical observations regarding online student engagement amid the pandemic.

3.4.4 Integrated Analysis

This stage is central to realizing the analytical depth of the mixed-methods approach. This study moves beyond a simple juxtaposition of data by engaging its quantitative and qualitative components in a meaningful dialogue. This is achieved through intentional connection and integration. First, the quantitative results directly inform the qualitative phase, guiding purposeful sampling and providing core questions for the interview protocol. Subsequently, the two sets of findings are presented together, laying out overall trends alongside underlying mechanisms to support, supplement, and clarify each other.

3.5 Ethical Considerations

UWTSD granted permission for the investigation, with ethics approval from the university, ensuring compliance with exemption requirements. After obtaining approval from D University's institutional level, I sought and obtained permission from the relevant colleges and departments, ensuring alignment with institutional policies and protecting participant rights throughout the data collection process.

The next phase involved working through these departments to identify and recruit the sampled students and teachers. This process included the implementation of informed consent procedures. All questionnaire respondents and 14 interview participants were required to fill in written informed consent before data collection, following the ethical principles of voluntary participation and transparency (Beauchamp & Childress, 2019; Bryman & Bell, 2007). The consent form clearly described the study's purpose (exploring online learning engagement during the pandemic), procedures (questionnaires, interviews), and expected duration. It stated that participation was voluntary, with the right to withdraw at any time without penalty (Bryman & Bell, 2007), and clarified the right to skip uncomfortable questions. For students, consent forms were distributed via the university's online platform with opt-in / opt-out options. Interviewed teachers signed physical forms after a verbal briefing on study details, ensuring the consent process was accessible and

clear. Participant anonymity and the security of all data were strictly maintained throughout the study. Identifiable information was neither collected nor linked to responses, ensuring that all data remained anonymous.

These practices not only protect participants but also enhance the study's credibility by ensuring compliance with international research ethics standards.

3.6 The Construction of the Initial Scale

This study developed core measurement scales through a rigorous, step-by-step and evidence-based process, anchored in educational ecology theory. The whole procedure prioritised sound psychometric quality, construct validity, and contextual suitability for Chinese College English learners.

3.6.1 Theoretical Grounding and Item Generation

Three complementary strategies guided item development to secure breadth and relevance. First, this study employed the conceptual categories of measurement items from classic research (Fredricks et al., 2004; Kahu, 2013; Reeve, 2013) as the basis for classification. Second, recognised existing scales were culturally and linguistically adapted via translation and back-translation, with wording adjusted to fit China's higher education and online English learning context (Sun & Rueda, 2012; Fidan & Uslue, 2023; Xu & Qiu, 2025; Sun, 2022; Sun et al., 2025;). Third, original items were newly created to capture underrepresented constructs, such as ecological interactive engagement and context-specific institutional support. These new items were deductively developed from educational ecology literature and College English teaching demands.

Two context-specific scales were finalised: "Student Learning Engagement in College English Online Teaching" (measuring cognitive, interactive, affective and behavioural dimensions) and "Factors Influencing Student Learning Engagement" (assessing student-self, peer, teacher, family, and institutional support from an ecological perspective).

3.6.2 Expert Review for Content Validity

A five-member expert panel, consisting of two applied linguistics scholars and three senior College English teachers, independently assessed all initial items. Using a four-point rating scale, they evaluated each item for relevance and clarity. Ambiguous or low-relevance items were revised, combined or deleted based on quantitative scores and qualitative comments.

Then based on the analysis of theoretical and operational constructs in Chapter 2, two scales were formed (see Appendix A):

Scale 1 concerning the dimensions of OSE includes:

Behavioural Engagement (Items 1-8): Participation in online classes, attendance, discussions and focused learning.

Affective Engagement (Items 9-16): Positive Learning experience (recognition of online learning effectiveness) and learning anxiety.

Cognitive Engagement (Items 17-24): Use of deep cognitive strategies (e.g., goal-setting, self-monitoring, time management) and metacognitive self-regulation.

Interactive Engagement (Items 25-31): Adaptation to the learning environment and tools, communication with teachers and peers, family and school influence, and online feedback (framed within educational ecosystem theory).

Scale 2 concerning influencing factors of OSE includes:

Teacher support (Items 1-7): Management (supervision, feedback), emotional motivation, and provision of learning materials/platforms.

Peer support (Items 8-13): Collaborative learning, mutual assistance, and motivational role-modelling.

Student self-support (Items 14-23): Motivation, confidence, self-management and perception of technology usefulness / ease of use (informed by TAM theory).

Institutional support (Items 24-27): Policy guidance, technological infrastructure (LMS, tools), and quality assurance mechanisms.

Family support (Items 28-30): Home learning environment (devices, space) and parental emotional support (See Appendix A).

Finally, Questionnaire 1 (assessing the dimensions of OSE) comprised 31 items across four dimensions: Behavioural, Affective, Cognitive and Interactive. Questionnaire 2 (examining Influencing Factors) consisted of 30 items across five dimensions: Teacher, Peer, Student-self, Institutional and Family support.

3.7 Pilot Study and Refinement

The pilot study was designed to evaluate the feasibility and practicality before conducting the quantitative research, primarily involving questionnaires.

3.7.1 Objectives and Design of the Pilot Study

Before administering the questionnaires to the research subjects, they needed to be tested. The purpose of the try-out or pilot was to assess their quality so that revisions and improvements could still be made before they were used with the actual subjects in the research. (H. W. Seliger & E. Shohamy, 1989: 195). The overall aim was to assess and improve the quality of the questionnaires (Churchill, 1979). Churchill's work emphasized the significance of pre-testing in refining measurement instruments, ensuring that they accurately captured the intended constructs. The pilot study surveyed 82 second-year students (similar to but not part of the main study sample) with online learning experience during lockdown using WJX (<https://www.wjx.cn/>). Both questionnaires employed a 5-point Likert scale, and the sample size, which fell within the recommended range of 50–200 (Qin, 2009), ensured a valid preliminary analysis.

3.7.2 Pilot Study Procedures

The study applied item analysis and construct-validation procedures, including descriptive statistics, item-total correlation, homogeneity testing, reliability and validity analysis, and exploratory factor analysis (EFA). These steps, conducted with SPSS 26.0, helped identify and refine items to enhance the overall scale, as emphasized in measurement-development

literature (Nunnally & Bernstein, 1994). The findings presented in this section are from the third round of pilot testing, which served to finalize the scale.

3.7.3 Pilot Study Findings and Instrument Revisions

A pilot study was conducted to systematically examine the properties of the research instrument and identify items that require modification or elimination. Based on the empirical evidence gathered from these analyses, specific refinements were made to the instrument's items and structure.

1) Descriptive Statistics

Descriptive statistical analysis was used to identify outliers and assess test validity. The data showed normal distribution in skewness and kurtosis, allowing for the use of parametric tests to analyse relationships between factors influencing engagement. This led to the removal of one item (a14, mean <3.0) from Questionnaire 1's 31 initial items (Appendix B.1.1). Questionnaire 2's analysis (30 items; Appendix B.1.2) revealed no extreme values, with all items meeting standards.

2) Correlation between Item Scores and Total Scale Scores

In addition to the extreme group method, homogeneity testing is also used for item screening (Wu, 2010: 160). A higher correlation between an item and the total score indicates greater homogeneity and better alignment with the measured psychological traits or behaviours. Items with non-significant or low correlations ($r < 0.4$) are recommended for deletion (Wu, 2010: 181). Accordingly, in Questionnaire 1 (Appendix B.2), two items (a23 and a24) were removed due to low correlations with the total score (0.307 and 0.306, respectively), despite reaching significance. All items in Questionnaire 2 (Appendix B.2) showed correlations above 0.4 and were retained.

3) Reliability and Validity Analysis

The reliability of the scale was assessed using Cronbach's alpha. For Questionnaire 1, after removing 3 items through descriptive and correlational analysis, the 28 remaining items demonstrated excellent internal consistency ($\alpha = 0.958$). Questionnaire 2 also showed high

reliability ($\alpha = 0.97$). Both values exceed the conventional threshold of 0.7, indicating good internal consistency for the overall scale and its component dimensions. (Detailed results are provided in Appendix B.3)

According to Polit and Beck (2017), validity analysis includes two types: one is content validity, which established through expert evaluation, ensures the questionnaire comprehensively represents the target construct. In this study, five experts assessed item clarity, conceptual coverage and categorical coherence. The other is constructing validity, which examines whether the measurement aligns with underlying theoretical frameworks. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity were used to assess suitability for factor analysis, with $KMO > 0.5$ indicating adequate inter-item correlations.

As a result, both questionnaires showed KMO values well above 0.5 (Questionnaire 1: 0.852; Questionnaire 2: 0.848), and Bartlett's test results were significant ($p < 0.05$), confirming that the data were appropriate for factor analysis (see Appendix B.4).

4) Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis is applicable when the number and structure of potential factors are unknown, serving to explore possible dimensions by summarizing multiple correlated observed variables into a smaller number of meaningful "factors" (or dimensions) and understanding which variables may collectively measure the same underlying concept (Qin, 2003). The primary method it employs is Principal Component Analysis. The specific steps are as follows:

Questionnaire 1

Commonality shows how well items represent shared characteristics. Factor loading shows how strongly variables are related to factors. As noted by Costello and Osborne (2005), commonality tells researchers how much of an item's variance is explained by the common factors, while factor loading indicates the strength of the link between variables and factors. Items with low commonality or low factor loadings (usually below 0.4-0.5) are often considered weak or unrelated to the underlying constructs and may be removed. This

process of refining items based on commonality and factor loading follows standard practices in scale development, as discussed in DeVellis (2017), where repeated analysis of these metrics helps improve the scale's structure and validity.

The commonality analysis for Questionnaire 1 (Appendix B.5.1; B.5.2; B.5.3) yielded values between .436 and .868, indicating that the factors explained moderate to strong variance in the items and that all 28 items showed good internal consistency. Items **a25** and **a31** were removed due to significant cross-loadings above 0.5, while **a6** and **a9** were deleted for having loadings below 0.5 on all factors. The five factors represented cognitive, interactive, affective, and behavioural engagement, plus a fifth factor for Online learning time- management.

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Communalities
Factor 1: Dimension OLCE (20.24% of Variance Explained)						
a19	.827					.838
a22	.772					.763
a17	.741					.771
a21	.736					.673
a18	.727					.742
a16	.699					.729
a20	.684					.687
a15	.623					.596
Factor 2: Dimension OLIE (15.59% of Variance Explained)						
a28		.747				.821
a29		.730				.820
a26		.722				.768
a30		.697				.784
a27		.691				.680
Factor 3: Dimension OLAE (13.05%)						
a12			.722			.734
a13			.681			.728
a11			.644			.692
a10			.567			.614
Factor 4: Dimension OLBE (11.62%)						
a4				.825		.820
a3				.812		.868
a1				.580		.554
a5				.518		.782
Factor 5: Dimension OLS (10.72%)						
a7				.815		.761
a8				.803		.690
a2				.539		.527
Eigenvalue	5.668	4.366	3.654	3.256	3.003	
Cumulative Variance Explained (%)	20.24	35.83	48.89	60.51	71.24	

Table 3-2 Results of Exploratory Factor Analysis (Rotated Component Matrix) (N=24 Items)

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Note: Only factor loadings with absolute values greater than 0.50 are displayed for clarity.

Summary of Item Deletion:

Deleted items: a25, a31, a6, a9.

OLCE: Online learning Cognitive Engagement; OLIE: Online learning Interactive Engagement;

OLAE: Online learning Affective Engagement; OLBE: Online learning Behavioural engagement;

OLTS: Online learning Time Management

After removing these items, a final EFA was conducted with the remaining 24 items. Table 3-1 presents the rotated factor loadings, communalities, eigenvalues, and explained variance for the final model.

Questionnaire 2

In questionnaire 2, commonality testing indicated a high degree of homogeneity for 30 items ranged from .604 to .872. However, three items were identified as problematic and removed from the final scale: Items **b1** and **b7** exhibited significant cross-loadings (loadings > 0.5 on two factors). Item **b11** failed to load sufficiently (loading < 0.5) on any factor. Factor analysis extracts five factors, which were related to self-support, teacher support, peer support, institutional support and family support.

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Communalities
Factor 1						
b20	.777					.821
b18	.774					.758
b17	.766					.757
b16	.762					.747
b22	.739					.806
b23	.728					.785
b19	.728					.745
b15	.724					.793
b21	.634					.736
b14	.540					.653
Factor 2						
b4		.832				.872
b5		.784				.822
b3		.749				.810
b6		.703				.790
b2		.661				.744
Factor 3						
b12			.755			.810
b13			.750			.812
b10			.737			.854
b9			.687			.770
b8			.644			.658
Factor 4						
b25				.797		.850
b27				.781		.784
b24				.706		.786
b26				.686		.738
Factor 5						

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Communalities
b30					.797	.870
b29					.773	.839
b28					.642	.703
Eigenvalue	7.220	4.650	4.631	3.755	3.023	
% of Variance	24.07	15.50	15.44	12.52	10.08	
Cumulative %	24.07	39.57	55.00	67.52	77.60	

Table 3-3 Results of Exploratory Factor Analysis (EFA) (Rotated Component Matrix) (N=27 Items)

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations. Factor loadings with absolute values greater than 0.50 are displayed.

Summary of Item Deletion:

Deleted items: b1, b7, b11.

After removing these items, the final EFA was run with the remaining 27 items. The final result is shown in Table 3-3.

5) Consistency Test of all Dimensions

Statistical analysis indicated good overall reliability and validity for both questionnaires, though internal consistency for each dimension required further verification. For Questionnaire 1 (Appendix B.6.1), all Cronbach's alpha values exceeded 0.8 except Dimension 5 (0.760), which also showed a weak item correlation (.477) and no meaningful improvement in alpha after item removal. Thus, Dimension 5 (items a2, a7, a8) was deleted. For Questionnaire 2 (Appendix B.6.2), Cronbach's alpha values indicated excellent reliability for Dimensions 1-5.

3.7.4 Final Adjustments to the Main Study Protocol

Based on the pilot study, the valid dimensions and corresponding items for the Online Student Engagement of Questionnaire 1 were confirmed as follows:

Dimension 1 (OLCE): a15-22

Dimension 2 (OLIE): a26-30

Dimension 3 (OLAE): a10-13

Dimension 4 (OLBE): a1, 3-5

The retained dimensions and items of Questionnaire 2 were:

Dimension 1 (SS): b14-23

Dimension 2 (TS): b2-6

Dimension 3 (PS): b8-10, 12-13

Dimension 4 (IS): b24-27

Dimension 5 (FS): b28-30

In total, Questionnaire 1 retained 21 items (10 removed: a2, a6-8, a14, a23-25, a31), and Questionnaire 2 retained 27 items (3 removed: b1, b7, b11). Both questionnaires achieved satisfactory reliability and validity with refined dimensions and items appropriate for the research context.

3.8 Finalization and Administration of the Formal Questionnaire

For the convenience of the research, according to the sequence of dimensions, the remaining items were reordered, Table3-4 shows the form of the questionnaire, including specific items and dimensions of the two questionnaires.

	Dimension	Item number
Part one	Basic personal information	1, 2, 3, 4, 5, 6, 7
Part two Scale of Student Learning Engagement in College English Online Teaching During the Pandemic in China Questionnaire 1	Online learning Cognitive Engagement (OLCE)	OLCE1, OLCE2, OLCE3, OLCE4, OLCE5, OLCE6, OLCE7, OLCE8
	Online learning Interactive Engagement (OLIE)	OLIE 1, OLIE 2, OLIE 3, OLIE 4, OLIE 5
	Online learning Affective Engagement (OLAE)	OLAE1, OLAE2, OLAE3, OLAE4
	Online learning Behavioural engagement (OLBE)	OLBE1, OLBE2, OLBE3, OLBE4
Part three Scale of Factors Influencing Student learning engagement in College English Online Teaching During the Pandemic in China Questionnaire 2	Self-Support (SS)	SS1, SS2, SS3, SS4, SS5, SS6, SS7, SS8, SS9, SS10
	Peer Support (PS)	PS1, PS2, PS3, PS4, PS5
	Teacher Support (TS)	TS1, TS2, TS3, TS4, TS5
	Institutional Support (IS)	IS1, IS2, IS3, IS4
	Family Support (FS)	FS1, FS2, FS3

Table 3-4 The Formal Questionnaire

Therefore, four dimensions and five supporting factors were established. And then the survey was administered online through WJX (<https://www.wjx.cn/>) from July 8 to July 15, 2024, prior to the conclusion of the semester. To ensure data integrity, only one submission per respondent was permitted. From over 600 collected responses, 502 valid samples remained after filtering out incomplete, extremely short, or repetitive ones (91.4% validity rate).

Demographic Variable	Category	Frequency (n)	Proportion (%)
Gender	Male	211	42.03%
	Female	291	57.96%
Grade	Year 2	290	55.77%
	Year 3	113	22.51%
	Year 4	99	19.72%
Major	Science and Engineering	337	67.31%
	Humanities and Social Sciences	111	22.11%
	Arts	28	5.57%
	Other	26	5.17%

Table 3-5 Demographic Characteristics of the Student Participants (N=502)

Note: Due to rounding, proportions may not sum to exactly 100%.

The demographic distribution agreed with the sampling strategy. Second-year students formed the majority, as they were still enrolled in mandatory English courses and more

engaged in related activities. Upperclassmen (third- and fourth-year students), having completed these courses, showed relatively lower participation.

3.9 Interview Design and Guide

The qualitative phase of this study employed semi-structured interviews to elicit rich, detailed narratives from participants regarding their experiences and perceptions of online engagement.

3.9.1 Participant Selection and Rationale

A purposive sampling strategy (see 3.2.2) was used to recruit participants who could provide information-rich cases relevant to the research questions. From University D, nine students across second, third, and fourth years were selected to capture a range of experiences shaped by varying academic maturity and familiarity with university-level online instruction. Concurrently, five teachers were recruited, all aged 35 or above and holding diverse academic ranks (Lecturer, Associate Professor, Professor). This criterion ensured the inclusion of educators with substantial teaching experience and, likely, varied exposure to pedagogical shifts before and during the pandemic. This strategic sampling aimed to generate perspectives from both primary actors in the learning ecosystem, allowing for data triangulation between learner and instructor viewpoints.

3.9.2 Interview Guide Development and Piloting

The interview Guide (Outline) was developed as a flexible guide rather than a rigid questionnaire. Initial questions were derived directly from the prominent themes and puzzling relationships identified in the preceding quantitative data analysis following Seidman's (2013) recommendation to shape interview items with preliminary data. Student interviews (Appendix F.1) explored online learning attitudes, motivation, self-efficacy, self-discipline, and key factors influencing engagement, helping unpack students' complex online learning experiences. Teacher interviews (Appendix F.2) focused on online teaching preparation, classroom management, student interaction, and self-evaluated teaching outcomes. Drawing on scholarly consensus (Cohen et al., 2018; Darling-Hammond &

Bransford, 2005), capturing teachers' firsthand perspectives reveals practical challenges and instructional strategies.

Overall, the student and teacher interview questions, tailored to Chinese College English online teaching context, jointly strengthen the credibility of this study. Following best practices for qualitative inquiry (Kvale & Brinkmann, 2009), the Guide underwent several iterations of refinement.

A critical step in ensuring the validity and clarity of the questions was a piloting phase. A pre-interview was conducted with two students and one teacher not included in the main sample. This pilot served to: (a) estimate the interview duration, (b) assess the clarity and lack of bias in the questions, and (c) refine probing and follow-up techniques. Feedback from this pilot led to adjustments in wording and the sequencing of questions, resulting in a final protocol that fostered a more natural and productive dialogue.

3.9.3 Data Collection and Ethical Assurance

Formal interviews were conducted between June 2024 to July 2024. During the implementation phase, interviews were conducted using Guide, recorded with prior informed consent from all participants and carried out in a semi-structured manner. This approach allowed the researcher to maintain focus while encouraging open dialogue, consistent with Patton's (2002) principle of balancing structure with flexibility to explore participants' experiences in depth.

The student interviews were conducted face to face in a quiet and comfortable office close to their dormitory. Before the formal interview, a warm-up conversation was used to help the interviewees relax. The average interview duration was 32 minutes and 35 seconds.

The teacher interviews were conducted online via Tencent Meeting, with all five interviews recorded simultaneously. Each interview lasted approximately 30 to 60 minutes, and the entire interview process was recorded by Tencent Meeting.

3.9.4 Data Management and Processing

Following data collection, a literal transcript was made from the recordings. As Braun and Clarke (2006) emphasized, accurate transcription is essential, as it captures subtleties of responses and forms the foundation for reliable analysis.

After the interview was completed, I used the writing function of Tencent Meeting to organize the interview recording into text. The pronunciation of the 14 interviewees was relatively clear, so the accuracy rate of speech recognition was relatively high. However, due to the differences between spoken language and written language, there were many modal particles in the text, the sentences were not coherent, and there were many repeated words and sentences. I checked the texts against the recording, and under the condition of not affecting the original intention of the interviewee, conducted proofreading and verification to remove those modal particles and repeated ones. After verification, each recording text was numbered, and finally the original data was formed.

The final phase involved summarizing, analysing and interpreting the data, leading to the drafting of the research report. This comprehensive approach ensured that the findings were thoroughly derived from the participants' accounts and systematically presented.

This chapter has outlined the mixed-methods research design employed in the current study. To adequately investigate the multifaceted aspects of online student engagement, the study combined quantitative surveys with qualitative semi-structured interviews. Data collection included the use of standardized questionnaires and interview Guide. Subsequent analysis involved statistical processing of quantitative data using SPSS 27 and thematic analysis of qualitative data via Nvivo 14.0. Additionally, the chapter discusses the strategies implemented to ensure the reliability and validity of the instruments. Collectively, this sound methodological framework supports the credibility of the empirical findings presented in this research.

Chapter 4 Results

This chapter presents the study's findings in two distinct sections. The first section focuses on the quantitative strand, reporting descriptive statistics, correlation and regression analyses. The second section explores the qualitative outcomes through a detailed thematic analysis. Taken together, these results highlight the key patterns emerging from the data and interpret their practical and theoretical implications.

Section I Quantitative Research

To explore College English online student engagement in a systematic and quantifiable manner, this section reports findings from the quantitative phase of the study, addressing Research Questions 1 and 2. Data were obtained from a final sample of 502 students who completed the survey in full. The analysis provides a descriptive overview of four dimensions of students' online learning experiences and five categories of support factors. It further examines the interrelationships among these variables and evaluates the unique contribution of each support factor to online student engagement.

4.1 The Profile of Online Student Engagement

To explore Chinese College English students' multi-dimensional perceptions and experiences of online learning during the pandemic, this study investigates student engagement across four domains: behavioural, cognitive, affective and interactive engagement. Quantitative data initially reveal a pattern of moderate overall performance alongside evident internal divergence. The overall mean score of student engagement stands at 3.53, indicating a medium engagement level. Meanwhile, variations across dimensions reflect subtle tensions and differing priorities in students' learning experiences. Notably, interactive engagement (OLIE, $M=3.61$) registers the highest score unexpectedly, while cognitive engagement (OLCE, $M=3.45$) remains the lowest. This contrast is far from coincidental. It serves as a key to unlocking the complexity of students' online learning experiences.

	Minimum value	Maximum value	Mean value	Standard deviation
OLCE	1.00	5.00	3.4537	.74040
OLIE	1.00	5.00	3.6060	.75442
OLAE	1.00	5.00	3.5692	.78618
OLBE	1.00	5.00	3.4915	.79344
The general level	1.00	5.00	3.5301	.69454

Table 4-1 Descriptive Analysis of Online Student Engagement

OLCE: online learning cognitive engagement; OLIE: online learning interactive engagement; OLAE: online learning affective engagement; OLBE: online learning behavioural engagement.

Further analysis of score ranges reveals meaningful variation within the cohort. The presence of minimum scores of 1.00 across all dimensions indicates that a portion of students reported very low engagement or faced clear challenges in the online environment, even as the overall average remained moderate. Conversely, maximum scores of 5.00 in all dimensions reflect a subset of learners who reported consistently high engagement throughout. Together, these results illustrate a polarized landscape of online learning experiences, underscoring the coexistence of both highly engaged and less engaged students within the same instructional context—a finding that invites closer examination of the factors driving such divergence.

4.2 A Dimensional View of Engagement Levels

Additional findings from the descriptive analysis of each engagement dimension (see Appendix D) provide further detail on the patterns observed. The results are outlined below.

4.2.1 Deficient Strategies and Low Satisfaction in OLCE

The first prominent challenge emerges in the cognitive dimension. The data indicate that students do not lack effort, but rather the essential guidance to navigate online learning. A clear deficit in strategic forethought emerged as the most pronounced finding. The lowest-rated item across the entire OLCE scale was OLCE8 (*I had set up a plan for learning English online.*; M=3.22, Satisfaction=64.4%). This item, which directly measures the metacognitive practice of pre-planning, recorded the weakest level of student agreement. Closely related, the second-lowest-rated item was OLCE1 (*I was satisfied with the effect of my English online classes.*; M=3.29, Satisfaction=65.8%). This item assesses

students' overall satisfaction with their learning outcomes. The proximity of these two items at the lower end of the scale indicates a possible association between lower perceived learning effectiveness and less clearly defined learning plans.

These findings indicate that a notable proportion of students engaged in online learning with limited clarity regarding their learning pathways. Despite allocating substantial time to their studies, some reported dissatisfaction with their academic performance, a pattern associated with weaker planning and lower perceived outcomes. This contrasts with the relatively higher scores observed for interactive engagement, suggesting that students may have directed more effort toward visible, socially oriented interactions than toward sustained, self-regulated cognitive activities.

4.2.2 Active Synchronous Response and Inactive Asynchronous Engagement in OLIE

For interactive engagement, it indicated the students' active interaction via learning and teaching platform between the teacher and the learner, sharing and collaborative work with peers. The overall satisfaction percentage (72.12%) indicated that participants were generally satisfied. OLIE1 (*During online English classes, I prepared to answer the teacher's questions because they might randomly call on us.* Mean: 3.83, Satisfaction: 76.60%) had the highest mean score and satisfaction percentage, showing students' active participation in synchronous online class and a reliance on synchronous, teacher-driven interaction. OLIE2 (*I would interact and communicate with my English teacher by posting on platforms such as WeChat Work, online discussion forums, and message boards.* Mean: 3.36, Satisfaction: 67.20%) had the lowest mean score and satisfaction percentage. It seemed that students were weak in asynchronous, self-motivated interaction. Engagement was reactive (to the teacher) rather than proactive (with peers or resources). OLIE4 (*I would collaborate with group members online to complete English learning tasks.* Mean: 3.48, SD=1.002) had the highest standard deviation, indicating significant variability in responses. The high standard deviation for this item (OLIE4) pointed to a notable lack of consensus among students, indicating that collaborative online work is a highly variable experience.

The findings suggest that interactions during the pandemic were characterized primarily by passive participation within teacher-directed activities, rather than by sustained, proactive academic communication.

4.2.3 Emotional Expression and Academic Exchanges in OLAE

The emotional dimension of student experience appears to reflect a relative emphasis on visible social interaction over substantive academic engagement. The data show a notable difference between students' positive responses to straightforward socio-emotional cues and their reported enjoyment of more content-focused academic interaction. The highest-rated item across the entire engagement survey was OLAE4 (*During online classes, my English teacher used to send "laughing face" emojis in the online chat, which made me feel warm.*). This item, measuring a response to a simple gesture of teacher social presence, received a mean score of 3.92, with 78.4% of students expressing agreement or strong agreement. In direct contrast, the lowest-rated item within the affective subscale was OLAE2 (*I enjoyed interacting with teachers online about English issues.*), which measured the reported enjoyment of academic interaction. This item received a significantly lower mean score of 3.27 (Satisfaction: 65.4%).

Together, these two data points delineate a clear pattern within affective engagement: students reported strong positive affective responses to low-effort, non-academic gestures of teacher warmth and presence online. Conversely, they reported markedly lower enjoyment from the very academic interactions that such gestures are often designed to facilitate.

4.2.4 In-class Participation and Pre-class Preparation in OLBE

Lastly, behavioural data mirror how the aforementioned cognitive and interactive patterns manifest in practical learning behaviours. Students generally keep up well with live lectures (OLBE4: *During online English classes, I can keep up with the teacher's live pace and teaching content.* Mean: 3.65, Satisfaction: 73.00%), which further confirms their role as compliant followers. By contrast, autonomous learning practices such as pre-class preview (OLBE1: *Before the teacher starts the online class, I use online audio and video*

materials to preview the English lesson in advance.) are notably inadequate. Collectively, these findings outline a distinct behavioural pattern: students stay attentive during live synchronous sessions but fail to make sufficient preparations in private study. Their learning behaviours rely heavily on external organisation and immediate prompts from teachers.

4.2.5 Summary

The overall mean engagement score of 3.53 indicates a moderate level of engagement. However, variation across dimensions reveals differing priorities. Surprisingly, interactive engagement (OLIE, $M = 3.61$) is the highest, while cognitive engagement (OLCE, $M = 3.45$) is the lowest. The data present a profile of engagement in which students relied considerably on external guidance and structured learning arrangements.

During the pandemic, Chinese College English students' online learning experiences reflected a combination of strengths and limitations. On the emotional level, they valued interpersonal connection and responded positively to teachers' emojis. Behaviourally, they generally adhered to classroom schedules and remained attentive during in synchronous sessions. In terms of interaction, they participated actively when responding to teachers' questions.

At the same time, the findings indicate limited use of autonomous learning strategies and less consistent engagement in self-directed cognitive activities. Certain areas, such as pre-class preparation and asynchronous communication, were less developed. Their perceived engagement appears to be shaped largely by contextual factors and external prompts, especially real-time teacher guidance, rather than by internally driven motivation for in-depth, self-regulated learning.

These results address the core research question by highlighting a mixture of positive experiences and notable challenges. The overall pattern suggests that, in this emergency online learning context, student engagement was marked by a significant degree of external reliance alongside underdeveloped independent learning strategies.

4.3 Characteristics of Key Influencing Factors

To explore factors associated with online learning engagement, the study examined five key factors. As shown in Table 4-2, the data reveal a distinct hierarchy of these factors, suggesting that engagement is more closely related to external scaffolding than to student's internal resources.

Teacher support (TS) emerged as the most strongly perceived factor, surpassing even the student's own self-support (SS). This suggests that in the online environment, the instructor's role is felt as the most immediate and influential external driver of engagement. It was closely followed by institutional (IS), family (FS), and peer (PS) supports, all reporting similar mean levels. Student self-support, while still positive, was rated the lowest among the five factors.

Descriptive statistics				
	Minimum value	Maximum value	Mean value	Standard deviation
SS	1.00	5.00	3.7217	0.69405
PS	1.00	5.00	3.7454	0.74360
TS	1.00	5.00	3.9478	0.68917
IS	1.00	5.00	3.7888	0.75223
FS	1.00	5.00	3.7709	0.81947
The general level	1.00	5.00	3.79492	0.7412

Table 4-2 Descriptive Statistical Analysis of Influencing Factors of Online Student Engagement

SS: student self-support; PS: peer support; TS: teacher support; IS: institutional support; FS: family support.

The analysis of influencing factors indicated that external supports, particularly those provided by teachers, were prominently reported than students' internal self-regulatory capacities.

4.3.1 Reported Levels of Teacher Support

From Table 4-2, The combination of a high mean ($M=3.95$) and the lowest standard deviation ($SD=0.69$) across all factors indicated that teacher support was not only highly rated but also perceived consistently by the vast majority of students, establishing it as the strongest and consistently perceived factor of the online learning experience. Among them

(Appendix D), TS5 had the highest mean ($M=4.02$, satisfaction =80.4%). (*Encouragement and praise from teachers during online learning motivate me to better engage in English learning.*). This result reflected a highly significant and positive relationship between teacher encouragement and students' self-reported motivation and engagement in online English learning.

4.3.2 Reported Levels of Student Self-Support

In contrast to teacher support, student self-support (SS) emerged as the lowest-rated factor ($M=3.72$). This suggested that students' internal resources for managing online learning were a critical area of concern. This was most evident in item SS4 (*I was confident in overcoming difficulties and challenges in online English learning.* $M=3.61$, $SD=0.906$, satisfaction =72.7%), which received the lowest score within this dimension, indicating a pronounced lack of self-efficacy. Among them, the highest one was SS10 (*The stability of online learning networks helped me better engage in English learning.* $M=3.86$, $SD=0.832$, satisfaction=77.2%). This showed that the stable internet connectivity ensured the students' confidence in assessing online learning resources. Students' lack of confidence in their own ability to overcome challenges is the most significant internal barrier. The data indicated a critical dependency: students' engagement relied heavily on external supports, while their internal self-efficacy (self-regulation, confidence and resilience) was the weakest link.

4.3.3 Reported Levels of Peer, Institutional and Family Support

An analysis of peer support revealed a distinct pattern in how students valued different types of assistance. Students reported the highest agreement for practical, technical aid. Item PS5, concerning help with technical problems ($M=3.79$, $SD=0.873$, Satisfaction=75.8%), received the strongest positive rating within the peer support scale. In contrast, the lowest-rated item was PS1, concerning the benefits of collaborative group work ($M=3.09$, $SD=0.884$, Satisfaction=73.8%). This contrast in mean scores indicates that while peers were seen as a valuable resource for immediate technical troubleshooting, their role in facilitating deeper, project-based academic collaboration was viewed as significantly less beneficial.

Scores for institutional support (IS) showed moderate to high levels of student satisfaction

overall, with a moderate degree of variability. This pattern suggests a general, positive recognition of the institutional resources and infrastructure provided. While overall assessments were positive, students were more critical of certain specific support measures. The lowest mean score within the IS scale was for item IS4 (*The daily online attendance check by the class advisor at school could motivate me to study*; $M=3.71$), indicating that this particular administrative intervention was perceived as less motivating relative to other forms of institutional support.

Family support, while also receiving a moderate and positive average appraisal, presented a distinct data profile. It exhibited the highest variability ($SD=0.82$) among all the support factors measured. This high level of dispersion indicates a considerable divergence in student experiences, pointing to a wide spectrum of home learning environments from highly supportive to less conducive.

The findings present a multifaceted pattern: peer support was most often reported in relation to technical assistance, while institutional and family support received broadly positive evaluations. Family support, however, exhibited greater variability, suggesting differences in home learning conditions across participants.

4.3.4 Summary

The synthesis of these profiles suggests that engagement levels are not uniform across contexts but are shaped by varying forms of support. Interactive and affective engagement appear to be reinforced primarily by consistent teacher support, whereas comparatively lower levels of cognitive engagement correspond with more limited self-regulatory capacities, particularly self-efficacy.

The analysis of influencing factors aligns with engagement patterns observed across the four dimensions. In this context, the online learning experience for college English students can be characterized by a notable reliance on external scaffolding, especially that provided by teachers, while internal self-regulated learning capacities emerged as a key constraint on deeper engagement.

4.4 Group Differences in Engagement: Gender, Major and Year of Study

Following the establishment of the overall engagement profile, this study also examined whether demographic variables were associated with variations in engagement levels. Difference analyses, focusing on variables such as gender, major and year of study, were conducted to identify potential patterns in online student engagement and to assess the extent to which such variables may be related to observed differences.

4.4.1 The Effect of Gender Differences (t-analysis)

The analysis indicated that gender exerted uneven effects on different facets of learning engagement, revealing distinct gender disparities specifically in the social-emotional dimensions of online learning. Minimal differences were observed in individual-oriented cognitive and behavioural engagement, while more noticeable variations appeared in interpersonal and affective domains.

Independent samples t-test results (Appendix E.1) demonstrated that male students reported marginally higher overall online engagement scores than their female peers (3.5664 vs. 3.5038), with a t-value of 0.996 and a statistically significant p-value of 0.042. This finding implies that within this research context, male students held more positive perceptions of the interactive and emotional components of the online English learning environment.

Further examination showed no significant gender differences for cognitive engagement ($t = 0.919$, $p = 0.072$) and behavioural engagement ($t = 0.631$, $p = 0.997$), as both p-values exceeded the 0.05 significance threshold. By comparison, significant gender differences were identified for interactive engagement ($t = 1.216$, $p = 0.048$) and affective engagement ($t = 0.850$, $p = 0.005$), with males consistently scoring higher than females on these two dimensions. The absence of difference observed in cognitive and behavioural engagement indicates that the core acts of focusing, persisting, and strategizing were similarly experienced across genders. Thus, pattern points to a divergence not in the capacity for engagement, but in how the online learning environment was experienced, particularly in its social and affective dimensions.

4.4.2 The Effect of Major Differences (t-analysis)

A gap in online engagement was observed across academic majors. Students in science-related fields reported higher overall engagement scores compared to those in liberal arts disciplines, with the most noticeable differences appearing in interactive and affective engagement, the same dimensions where gender-related variation was also noted.

While the two groups exhibited comparable levels of cognitive and behavioural engagement, reflecting similar individual learning efforts, they diverged notably in their social connection and emotional experiences within online learning. Independent samples t-test results (Appendix E.2) confirmed this significant overall difference: liberal arts students ($N = 111$, $M = 3.3106$, $SD = 0.58030$) and science students ($N = 337$, $M = 3.6190$, $SD = 0.70314$), with $t = -4.176$, $p = 0.020$. Consistent with the overall trend, no significant between-group differences existed for cognitive and behavioural engagement ($p > 0.05$), whereas science students scored significantly higher on interactive and affective engagement. The lack of significant difference in cognitive and behavioural engagement again indicates a shared baseline in individual learning effort, but a marked disparity in how students from different academic cultures connected with and felt about the online learning process.

4.4.3 The Effect of Year of Study Differences (ANOVA)

Unlike gender and academic major, year of study did not emerge as a significant predictor of online learning engagement. While descriptive statistics indicated a mild decline in engagement among students from Year 2 to Year 3, inferential testing revealed no meaningful differences across academic years in all four engagement dimensions. This consistency is a notable outcome, demonstrating that pandemic-era online learning challenges and experiences were shared uniformly among students regardless of their year in school.

As detailed in Appendix E.3, overall engagement means trended slightly low across second-, third- and fourth-year students. The one-way ANOVA results for the four engagement dimensions were as follows: $F = 1.553$, $p = 0.213$; $F = 1.577$, $p = 0.208$; $F = 1.240$, $p = 0.290$; and $F = 1.834$, $p = 0.066$. All p -values exceeded the 0.05 significance

threshold, confirming no statistically significant between-group differences. This uniformity is itself a significant finding. It indicates that the challenges and experiences of online engagement during the pandemic were pervasive across academic seniority

4.4.4 Summary

This section examined differences in student engagement across gender, academic major, and year of study. The results indicated statistically significant group disparities in engagement related to gender and major, whereas no significant differences emerged across year of study. Specifically, male students and students majoring in Science reported somewhat higher overall engagement levels compared with female students and Arts majors.

Such demographic and academic variations did not fundamentally determine students' cognitive and behavioural engagement, but they substantially shaped students' emotional and social experiences in online learning environments. The superior affective and interactive engagement demonstrated by Science and male students may reflect differences in online learning adaptability, communication preferences, or perceived content relevance.

Meanwhile, the lack of year-level differences confirms that the patterns of online student engagement identified in this study are consistent across different academic years. Overall, these findings suggest that background factors exert limited influence on the core dimensions of student engagement, yet they play a crucial role in differentiating students' subjective emotional and interpersonal learning experiences within online classrooms.

4.5 Correlation between Influencing Factors and Online Student Engagement

To explore the relationship between influencing factors and student online engagement (Research Question 2), we conducted Pearson correlation analyses. The primary goal of correlational analysis is to measure the strength and direction of the relationship between these variables. The strength of the relationship is typically measured using a correlation coefficient, which ranges from -1 to +1 to indicate positive, negative and zero relationship.

The correlation analysis revealed a consistent pattern of strong, positive relationships among all variables studied. Specifically, all four dimensions of online learning engagement demonstrated high inter-correlations, and each of the five influencing factors showed statistically significant, moderate-to-strong positive correlations with each dimension of student engagement. The key findings are as follows:

Relativity									
	OLCE	OLIE	OLAE	OLBE	SS	PS	TS	IS	FS
OLCE	1								
OLIE	.720**	1							
OLAE	.766**	.776**	1						
OLBE	.754**	.740**	.773**	1					
SS	.726**	.710**	.740**	.751**	1				
PS	.619**	.682**	.651**	.667**	.839**	1			
TS	.546**	.602**	.599**	.589**	.773**	.801**	1		
IS	.605**	.656**	.661**	.694**	.807**	.796**	.752**	1	
FS	.539**	.547**	.573**	.607**	.676**	.663**	.644**	.712**	1
** At the 0.01 level (two-tailed), the correlation was significant.									

Table 4-3 Correlation Analysis of Online Learning Engagement Dimensions and its Influencing Factors

This table indicated that higher levels of perceived support across all domains were associated with increased cognitive, interactive, affective and behavioural engagement among students in the online College English learning environment.

4.5.1 The Interconnected Nature of Engagement Dimensions

The analysis confirmed that the four dimensions of online learning engagement (OLCE, OLIE, OLAE, OLBE) were highly interrelated. The positive correlations suggested that student engagement was a holistic construct. For instance, students who were deeply engaged cognitively (e.g., understanding complex concepts) were also likely to be more active in their behavioural engagement (e.g., completing tasks), interactive engagement (e.g., communicating with peers), and affective engagement (e.g., maintaining a positive attitude).

4.5.2 The Strong Relationship between Support Systems and Engagement

A correlational analysis was conducted to examine the relationship between the support systems and online learning engagement. As summarized in Table 4-3, all five support factors demonstrated significant positive correlations with all four engagement dimensions with a correlation coefficient between 0.5 and 0.9.

1) Self-Support as the Strongest Predictor

Self-Support (SS) showed the strongest correlations with all engagement dimensions (e.g., $r = 0.726$ with cognitive engagement). This suggests that a student's own motivation, self-regulation, and responsibility are the most critical factors driving their overall engagement in the online learning process.

2) Significant Role of Peer and Teacher Support

Both peer support (PS) and teacher support (TS) showed strong positive correlations across all engagement types. This highlighted the importance of the learning community, indicating that collaborative interactions among students and active guidance from instructors were vital for maintaining engagement.

3) Impact of Institutional and Family Support

Institutional support (IS) and family support (FS) also showed moderate to strong positive relationships. For example, institutional support was notably correlated with affective engagement ($r = 0.661$), suggesting that reliable resources and a well-structured online environment contribute to students' emotional investment. Similarly, family support was positively correlated with behavioural engagement ($r = 0.607$), indicating that a supportive home environment may help students adhere to study schedules and complete tasks.

4.5.3 Summary

In summary, the findings suggest that engagement itself is a holistic state; a student who is cognitively immersed is also more likely to participate actively, collaborate with peers, and sustain a positive attitude. These dimensions do not appear in isolation, but operate dynamically in close interrelation.

This interconnectedness is powerfully nurtured by a network of supports, as all five support factors correlate significantly with all four engagement dimensions. Within this ecosystem, a student's own motivation and self-regulation emerge as the strongest single driver. It operates within a vital social and structural context: peer and teacher support

form the sustaining core of the learning community, while institutional resources foster emotional investment and family support promotes behavioural consistency.

Overall, the results indicate that robust engagement arises when individual drive interacts with a multilayered framework of support, rather than stemming from any single factor alone.

4.6 The Effect of Supporting Factors on Student Online Engagement

To identify which support factors independently predict online engagement and assess their relative importance, multiple linear regression analyses were conducted following the correlation tests. A series of five regression models were constructed, with gender, year level, and major included as control variables. In these models, the five influencing factors, including student self-support (SS), peer support (PS), teacher support (TS), institutional support (IS), and family support (FS), were entered as independent variables to evaluate their unique predictive contributions to online student engagement (OSE).

4.6.1 Introduction to the Models

Specifically, treated students' online learning influencing factors as independent variables X, and each dimension and overall engagement as the dependent variable Y, and conducted a multiple regression analysis. After the testing of regression models, the results of the multiple regression analysis are presented in this section (see Table4-4), detailing the relationships between the independent variables and the dimensions of online student engagement. The findings provide insights into the significance and explanatory strength of each predictor in relation to the dependent variables.

According to Table 4-4, five multiple linear regression models were developed to assess the impact of various influencing factors on the four dimensions and the overall level of students' online learning engagement. All models were statistically significant ($p < .001$). The R^2 values indicated that the models explained a substantial portion of the variance in the dependent variables. The VIF values of the five independent variables across all five models ranged from 2 to 5, all below the threshold of 10, indicating no significant multicollinearity. The D-W values (close to 2) suggested no significant autocorrelation in

the residuals. The Adjusted R^2 values confirmed that the models were not overfitted. The F-statistics confirmed the overall significance of the models.

Independent variable	Dependent Variable OLCE			Dependent Variable OLIE			Dependent Variable OLAE			Dependent Variable OLBE			Dependent Variable OSE		
	Model 1			Model 2			Model 3			Model 4			Model 5		
	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β
SS	0.721	0.068	0.676**	0.416	0.069	0.382**	0.032	0.070	0.558**	0.605	0.068	0.530**	0.594	0.053	0.593**
PS	0.038	0.065	0.038	0.229	0.061	0.226*	0.024	0.067	0.023	0.055	0.065	0.051	0.086	0.051	0.093
TS	-0.098	0.060	-0.091	-0.012	0.061	-0.011	-0.013	0.061	-0.012	0.118	0.059	0.103*	-0.061	0.047	-0.06
IS	0.030	0.059	0.030	0.146	0.060	0.146*	0.143	0.061	0.137*	0.219	0.059	0.208**	0.135	0.046	0.146*
FS	0.084	0.041	0.093*	0.039	0.042	0.042	0.087	0.042	0.090*	0.129	0.041	0.134*	0.085	0.032	0.1*
F	113.395**			115.216**			128.047**			146.578**			208.3**		
R^2	.533			.537			.563			.596			.677		
ΔR^2	.529			.533			.559			.592			.674		
D-W	1.868			1.936			1.838			1.996			1.901		

Table 4-4 Multiple Regression Analysis Results

Note: *: $P < 0.05$, **: $P < 0.01$

SS=student self-support, PS=peer support, TS=teacher support, FS=family support, OSE=online student engagement

This table demonstrates that the regression models are robust and meaningful for analysing the relationships between the independent variables and the dependent variables.

The multiple regression analyses revealed a clear and distinct hierarchy in the influence of various support factors on different dimensions of online student engagement. Across all models, a single factor demonstrated consistent and dominant predictive power: student self-support (SS). It emerged not merely as a significant contributor but as the primary driver for every measured aspect of engagement. Beyond self-support, the significance and strength of other supporting factors varied dramatically depending on the engagement dimension. This indicates that these supports are not universally influential; rather, they target specific facets of the learning experience.

4.6.2 The Predictive Power of the Influencing Factors on Student Online Learning Cognitive Engagement

As shown in Table 4-4, Model 1 indicated that online learning self-support (SS) and family support (FS) had a significant positive impact on cognitive engagement ($\beta = 0.676$ and $\beta = 0.093$, respectively; $p < 0.05$). In contrast, the effects of peer support (PS), teacher support (TS), and institutional support (IS) were not statistically significant ($p > 0.05$).

The standardized regression equation is as follows:

$$Y1(OLCE)=0.676*L(X1 SS)+0.093*T(X5 FS)$$

According to above equation, L(X1 SS) is the first standardized predictor and exerts a positive and relatively strong influence on OLCE ($\beta = 0.676$), meaning that a one-standard-deviation increase in SS is associated with a 0.676-standard-deviation increase in OLCE. T(X5 FS) is the second standardized predictor and has a positive but very weak influence on OLCE ($\beta = 0.093$), indicating that a one-standard-deviation increase in FS corresponds to only a 0.093-standard-deviation increase in OLCE. For cognitive engagement, the mental investment in learning, self-support stood alone as a strong predictor, with family support playing only a minor, secondary role.

4.6.3 The Predictive Power of the Influencing Factors on Student Online Learning Interactive Engagement

In model 2, the standardized coefficients (β) of online learning self-support (SS), peer support (PS) and institutional support (IS) were 0.382, 0.226 and 0.146 respectively, indicating that they have a significant positive impact on online learning interactive engagement ($p < 0.05$). Regression analysis revealed that, among the three influencing factors, self-support (SS) in online learning had the highest coefficient, indicating its greatest influence on interactive engagement. In contrast, the effects of teacher support (TS) and family support (FS) were not statistically significant ($p > 0.05$).

The standardized regression coefficients are presented in the following equation:

$$Y2(OLIE)=0.382*L(X1 SS)+0.226*T(X2 PS)+0.146*P(X4 IS)$$

Therefore, self-support ($\beta = 0.382$, $p < 0.05$) had the strongest positive impact on online interactive engagement. This means that as an individual's self-support capabilities increase, their engagement in online interactive activities is expected to increase significantly. Peer Support ($\beta = 0.226$, $p < 0.05$) suggested that peer support also had a positive impact on online interactive engagement, though it was weaker than self-support. This indicates that interaction and collaboration with peers contribute positively to

engagement but to a lesser extent. Institutional Support ($\beta = 0.146$, $p < 0.05$) had a positive but relatively weaker impact on online interactive engagement compared to both student self-support and peer support. This means that resources and guidance from the institution contribute to engagement, but the effect is not as strong as self-support or peer support.

4.6.4 The Predictive Power of the Influencing Factors on Student Online Learning Affective Engagement

In Model 3, online learning self-support (SS), institutional support (IS), and family support (FS) showed significant positive effects on affective engagement ($\beta = 0.558$, 0.137 , and 0.090 , respectively; $p < 0.05$). In contrast, the effects of peer support (PS) and teacher support (TS) were not statistically significant ($p > 0.05$).

The equation using standardized coefficients is:

$$Y3(OLAE)=0.558*L(X1\ SS)+0.137*T(X4\ IS)+0.09*P(X5\ FS)$$

These findings demonstrate the collective contribution of self-support, institutional support, and peer support to OLAE, with self-support ($\beta = 0.558$, $p < .05$) leading the effects, followed by institutional ($\beta = 0.137$) and peer support ($\beta = 0.090$). Specifically, a student's affective engagement increases with their level of self-support.

4.6.5 The Predictive Power of the Influencing Factors on Student Online Learning Behavioural Engagement

In model 4, the standardized coefficients (β) of online learning self-support (SS), teacher support (TS), institutional support (IS) and family support (FS) were 0.530 , 0.103 , 0.208 and 0.134 respectively, indicating that they had a significant positive impact on online learning behavioural engagement ($p < 0.05$). Among the four influencing factors, the regression analysis showed that student self-support (SS) in online learning had the highest coefficient, indicating its greatest impact on behavioural engagement. In contrast, the p-values for peer support (PS) were greater than 0.05 , indicating a non-significant effect.

The standardized regression equation is as follows:

$$Y4(OLBE)=0.530*L(X1 SS)+ 0.103*L(X3 TS) + 0.208*T(X4 IS) + 0.134*P(X5 FS)$$

The regression equation for predicting Online Learning Behavioural Engagement (OLBE) was constructed based on the contributions of self-support (SS), teacher support (TS), institutional support (IS), and family support (FS). The standardized coefficients (SS: $\beta = 0.530$, TS: $\beta = 0.103$, IS: $\beta = 0.208$, FS: $\beta = 0.134$) represent the expected change in the OLBE score for a one-unit increase in the corresponding independent variable, holding all other variables constant. For instance, a one-unit increase in self-support predicts a 0.530-unit increase in OLBE. Among these predictors, SS demonstrated the strongest predictive power, followed by IS and FS, with TS showing the weakest influence. Therefore, higher levels of self-support, along with greater institutional, teacher and family support, are associated with increased behavioural engagement in online learning.

4.6.6 The Predictive Power of the Influencing Factors on Overall Online Student Engagement

Multiple regression analysis was conducted with self-support (SS), peer support (PS), teacher support (TS), institutional support (IS) and family support (FS) as the independent variables X5, and online student engagement as the dependent variable Y5.

In model 5, it can be observed that the standardized coefficients for the influencing factors of online learning, student self-support (SS), peer support (PS), institutional support (IS) and family support (FS), were 0.593, 0.093, 0.146, and 0.1 respectively. This indicated that all four variables had a significant positive impact on students' online engagement ($p < 0.05$). Among these influencing factors, online learning self-support (SS) had the highest regression coefficient, suggesting that it exerted the greatest influence on online learning engagement. In contrast, the factor of teacher support: $\beta = -0.06$, $p = 0.193$, showed a not positive influence OSE, and the p-value for teacher support (TS) was greater than 0.05, failing to reach a significant level, suggesting that when the variance explained by all other factors was accounted for, the unique contribution of teacher support to the overall engagement score was not evident.

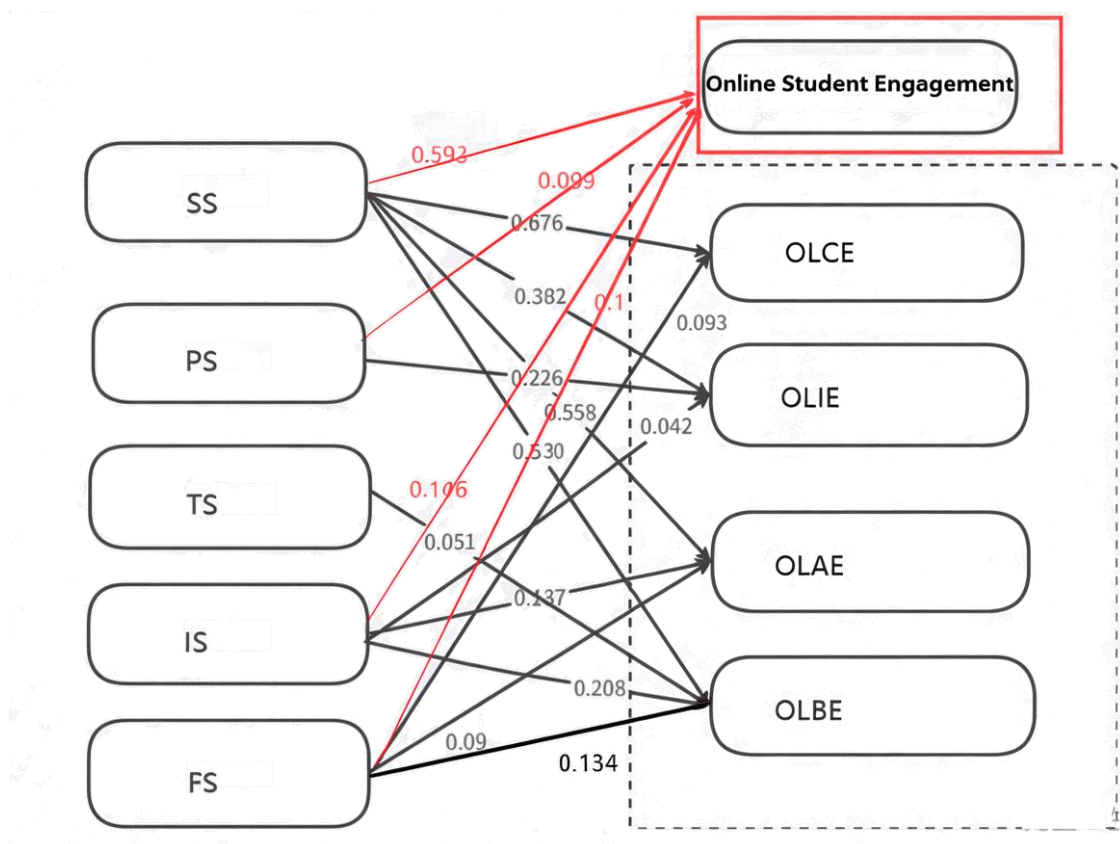
The effect of peer support on online student engagement was not statistically significant ($p = 0.089$, $p > 0.05$), but the coefficient was positive, suggesting there might be a slight positive influence. Therefore, student engagement in online learning behaviours increases with higher levels of self-support, peer support, institutional support, and perceived family support.

The results of the standardized regression are shown in this equation:

$$Y5(OSE) = 0.593 * L(X1 SS) + 0.093 * L(X2 PS) + 0.146 * T(X4 IS) + 0.1 * P(X5 FS)$$

4.6.7 Path Analysis of Factors Influencing Online Student Engagement

The five multiple linear regression models present the individual and combined effects of five influencing factors on students' overall online engagement. This analysis led to the creation of a path diagram showing the pathways from each variable to the four dimensions of engagement and to the overall engagement.



Graph 4-1 A path Analysis Diagram of the Influencing Factors on Online Student Engagement

OLCE: online learning cognitive engagement; OLIE: online learning interactive engagement;

OLAE: online learning affective engagement; OLBE: online learning behavioural engagement

SS: student self-support; PS: peer support; TS: teacher support; IS: Institutional support;

FS: family support.

The path analysis (Graph 4-1) synthesizes these relationships into a visual narrative. It confirms the central, radiating influence of self-support, connecting it strongly to all four engagement dimensions and, by extension, to overall engagement. Institutional and family support appear as secondary, stabilizing strands with multiple but weaker connections. Peer support functions as a specialized link primarily to interaction, while the pathway from teacher support appears tenuous, contributing only a faint connection to behavioural engagement.

4.6.8 Summary

The results present a clear hierarchy of influence among the support factors. Predictive power rests decisively with the student self-support (SS), which emerged as the primary driver, not merely a contributor, across all dimensions of engagement. Among other support factors, institutional support (IS) showed the most consistent associations, significantly predicting multiple engagement types with its strongest effect on behavioural engagement. Family support (FS), while showing a modest positive influence across several dimensions, remained the weakest of the significant predictors. Peer support (PS) demonstrated a focused impact, contributing positively only to interactive engagement and showing no significant effect on overall engagement. Most notably, teacher support (TS) exhibited a minimal and isolated influence, reaching statistical significance solely for behavioural engagement.

This pattern culminates in the model for overall student engagement (OSE), where the unique contributions of each factor are quantified. Self-support maintained its dominant role ($\beta = 0.593$, $p < .001$), followed by significant but comparatively smaller effects for institutional support ($\beta = 0.146$, $p < .05$) and family support ($\beta = 0.1$, $p < .05$). Conversely, peer support ($\beta = 0.093$, $p > .05$) and teacher support ($\beta = -0.06$, $p > .05$) did not demonstrate a statistically significant unique influence on overall engagement.

Section II Qualitative Research

I explicitly adopt a reflexive approach to thematic analysis in qualitative research. This means I seek to understand participants' subjective realities and lived experiences while recognizing that their accounts are shaped by the broader context of university culture. Guided by my research questions "What intrinsic mechanisms underpin Chinese College English online student engagement, and how can understanding these mechanisms inform strategies for sustainable development in online teaching?" This study does not aim to reveal one definitive or objective truth. Instead, I aim to construct a coherent and insightful interpretation of the data.

4.7 Reflexive Coding process and Themes Constructed

Following Braun and Clarke's (2006) six-step framework for thematic analysis (see Chapter 3), the coding process progressed through familiarization, initial coding and theme development. While coding as a qualitative method allows for depth and nuance, it also presents challenges related to subjectivity and rigor. To address these, I have followed established thematic analysis practices outlined by Braun and Clarke (2019, 2020, 2022) and Mason (2002), aiming for a systematic, transparent, and well-documented analytical process. I conducted intercoder reliability checks to enhance the analytical rigor and transparency of the coding framework. Thus, although the findings remain interpretative and context-dependent, they provide meaningful and valid insights into the specific phenomenon under study.

4.7.1 Reflexive Coding Process

From the student interview data, 45 initial codes were generated, which were later refined and regrouped into broader thematic categories, including 1) pandemic experience, 2) adaptation, 3) institutional support, 4) personal perspectives, 5) distractions in online classes, 6) negative emotions, 7) benefits of online classes, 8) satisfaction with online classes, 9) limitations of online classes, and 10) teachers' guidance, 11) teachers' impact, 12) teachers' support, 13) personal growth, 14) academic development, 15) future expectation,

16) keeping attention, 17) cognition development, 18) resource utilization, 19) self-management, 20) learning plans, 21) improvement ability, 22) positive performance, 23) non-accomplishment, 24) commitment, 25) skilfulness, 26) intuitiveness, 27) confidence to manage, 28) self-discipline, 29) learning strategy, 30) adjustment, 31) challenges and setbacks, 32) autonomy and control, 33) self-directed learning, 34) personal goals, 35) physical space, 36) insufficiency of online learning environment, 37) user-friendliness, 38) assessment, 39) post-pandemic influence, 40) human environment, 41) peer interaction, 42) supervision ways, 43) platforms and tools, 44) rich online resources, 45) convenient learning tools.

My initial engagement with the teacher interview data, which involved reading and re-reading the transcripts, generated 24 initial codes: 1) not fully prepared, 2) teaching platform options, 3) application adaptation, 4) changes of teachers' roles, 5) screened teaching difficulty, 6) online teaching strengths, 7) online teaching limitations, 8) incorporate elements, 9) preferred contents, 10) positive effects, 11) negative effects, 12) interaction ways, 13) teachers' efforts, 14) periodical assessment, 15) final examination, 16) encouragement, 17) involvement, 18) task-driven, 19) skilfulness, 20) willingness, 21) inactivity to watch students, 22) ways to monitor, 23) resourcefulness, 24) application challenges.

At the third stage for searching for themes, data extracted from student and teacher interviews were interpreted and analysed to identify recurring patterns and conceptual categories. Themes are analytic outputs, not inputs, and are developed from codes—which themselves are also analytic outputs. They are constructed at the intersection of the data, the researcher's subjectivity, theoretical and conceptual understanding, and training (Braun and Clarke, 2022). Following this reflexive approach, I acknowledge my active role in constructing themes from the data. In advancing from codes to themes, I prioritized the significance and conceptual coherence of candidate themes over their frequency alone. My concurrent role as a teacher in College English courses informed the analysis, providing relevant pedagogical and contextual insight that aided in interpreting the data.

Based on the data collected from both students and teachers, Stage Four of thematic

analysis identified fourteen themes from student interviews and eleven themes from teacher interviews that were relevant to online student engagement in College English online teaching during the pandemic in China. The student-derived themes are 1) transition experience, 2) emotion experienced, 3) learning experience, 4) teachers' influence, 5) self-drive, 6) learning efficiency, 7) time management, 8) task completion, 9) navigating learning tools, 10) pace regulation, 11) learning challenges and autonomy, 12) goal setting and progress tracking, 13) physical environment, 14) human factors. From teacher interviews, the following 11 themes are 1) adjustment, 2) teacher's role, 3) teaching form, 4) diversification, 5) influence, 6) interaction, 7) evaluation, 8) maintaining motivation and focus, 9) mastery of software, 10) monitor, 11) platform and tools.

The process of defining and refining the final themes involved a recursive engagement with both the data and the theoretical lens of Online Student Engagement (OSE). Through this iterative analysis, I interpreted the themes as speaking to, and thus organized them for discussion around, five key dimensions of the student experience: attitude, motivation, self-efficacy, self-regulation and environmental impact. A parallel interpretive process with the teacher interview data led to a thematic structure organized around four dimensions: teacher attitude, pedagogical behaviour, course management and technology use. This organization represents my analytical synthesis of how the constructed themes coalesce to illuminate the core components of the engagement ecosystem, as understood through the OSE framework. The process of theme construction in this study is elaborated as follows.

4.7.2 Theme 1: From Context to System Resilience in Educational Emergencies

The literature consistently identifies a range of external factors that condition online student engagement, including socioeconomic status, family environment, peer relationships, teaching quality, curriculum design, and access to technological resources (Wentzel et al., 2020). Analysis of the interview data supports the critical influence of the external and situational factors that shape engagement.

1) Subtheme 1: Adaptive Responses to Sudden Pedagogical Discontinuity

The rapid transition to fully online instruction constituted a profound pedagogical discontinuity, disrupting established rhythms, roles and relational dynamics. The data reveals that the initial adaptive response to this rupture was a primary mechanism shaping the early ecology of engagement.

Statement 1: The abrupt transition has posed a significant challenge to teacher engagement in College English Teaching, leaving teachers disoriented in the initial period.

Despite the reforms in College English Teaching (CET) in China, most teachers remain accustomed to in-class teaching with students physically present in the classroom. Although MOOCs and teaching platforms have frequently introduced and promoted, there are no significant changes. Many teachers were unaccustomed to the online learning environment. In fact, since the CET reform a decade ago, teachers had been using the E-learning system based on the network as an auxiliary tool in English language teaching.

In the beginning, it did feel very sudden. As this was a completely online teaching environment, and we have no previous experience. The school recommended some learning platforms, such as Rain Classroom and Study Pass, but before the school was closed, almost no teachers actually used these tools in teaching (T1).

Mentally, I wasn't ready at all. I'd never really taught online before, so I was super nervous. Plus, being one of the older folks in the teaching research group, I'm not that good with all the software and gadgets—that made me feel kind of anxious too (T4).

I felt much worried. It was quite difficult to prepare for the video lesson at the beginning because I needed to learn how to use editing software to cut the course content into short videos of less than ten minutes (T2).

The College English teachers felt uneasy about the sudden change, as they were not well prepared for such comprehensive online teaching. Many teachers found it difficult to accept the new teaching mode without students physically present in the classroom. Their attitudes have a negative impact on their teaching engagement.

Statement 2: The sudden change has little impact on students' acceptance of the complete online teaching, showing their positive attitudes towards the new teaching mode.

When the pandemic struck China, students had to rapidly transition from traditional in-class College English learning to online teaching. Contrary to the teachers, students seemed to welcome the change from traditional face-to-face, in-class College English learning to a completely online format. The majority of students derived greater enjoyment from online activities than from offline ones.

I think this transformation is actually quite positive (S4).

Personally, this should be a good choice for me (S3).

We can save 15 minutes of walking to and from the classroom, which greatly improves our learning efficiency (S2).

I feel that online learning provides more convenience and flexibility for learning in certain aspects (S1).

The responses indicate that students have varying attitudes toward online teaching. It appears that students are able to adapt more quickly than their teachers, which positively impacts student engagement in online teaching. Young students prefer the flexibility of online activities without the restraints of time and space. They are able to acquire knowledge online more easily than veteran teachers through smartphones and other facilities. They also feel safer behind the screen. Thus, the substantial challenge is also an opportunity to revolutionize CET.

Statement 3: Teachers' prompt adaptation to the new teaching modes promotes student engagement in College English online learning.

Despite an initial period of difficulty, most teachers in China quickly adapted to the new situation within one or two weeks after the implementation of the new teaching mode, guided by the Ministry of Education of the People's Republic of China and the school

administration. They went through a phase of psychological and pedagogical adaptation, forcing themselves to learn and master online teaching methodologies and skills, including the use of video-conference software, online teaching platforms, and interactive tools, to improve teaching quality.

The school has organized some online lectures (T1).

Teachers shared their experiences with each other (T1).

The school recommended "Rain Classroom" and "Study Pass". They also held some online lectures, and I've been attending them to learn how to use these tools (T1).

Schools are mostly the ones organizing and guiding this change (S4).

Each university in China assumed significant responsibilities for online teaching and made efforts to support teachers by providing continuous training, facilities, and possible assistance. Teachers believed it was a great duty to excel in the new teaching mode.

By asking advice from young colleagues, consulting manuals and online training materials provided by the school, and using recommended platforms, I gradually became familiar with the operating procedures (T4).

It seems that I have also accepted this approach. I gradually adapted after a few weeks (S5).

The adaptation is reflected in the shift of teachers' roles. Compared with the traditional class teaching mode, the greatest change in the new teaching mode is the conversion of teachers' roles, from a mere knowledge transmitter to a facilitator, a mentor, a supervisor, a cooperator, a provider, and a monitor. Teachers are no longer simply imparting knowledge but guiding students to explore and learn independently.

In online teaching, teachers are not only organizers, but also need to play the roles of motivators and supervisors (T2).

In offline teaching, teachers are mainly responsible for imparting knowledge and

face-to-face communication, which makes people feel more grounded. In online teaching, course design is particularly important (T2).

Teachers' role changes from an assessor of learning results to a provider of feedback and guidance. They not only evaluate students' learning achievements but also provide timely feedback and guidance to help students improve.

Without that live interaction with my teacher, I find my motivation starts to lag. It's difficult to keep going like that indefinitely (S1).

I usually send messages to teachers through enterprise WeChat, and teachers will reply to me when they have time (S4).

From the responses to the question "What is the role of a teacher in online learning?", we can conclude that teachers have recognized the transformation of their roles in online education and have actively made changes to their teaching methods.

Statement 4: Though students embrace online teaching, they have to adapt to the new learning mode.

Without face-to-face communication with teachers and classmates, students found it difficult to build the same level of connection.

It's not as intuitive and vivid as offline teaching (S9).

Most online course software has certain limitations (S2).

When the teacher is talking (on the screen), I don't concentrate. It's easy to wander (S8).

Students had to adjust to the new online learning mode to enhance their skills. Since each student attended class from home, they were isolated from the physical classroom. For some students with limited digital skills, it took time to learn how to participate in live-streaming classes, submit assignments online, and interact with teachers and classmates in the virtual space. However, as time went by, most students gradually adapted

to this new learning mode.

Online learning provides more convenience and flexibility for learning in certain aspects (S1).

They learned to manage their time more independently, as they no longer had the fixed class schedules and classroom-based learning rhythms.

Online English learning is great, because it gives me a very high degree of freedom (S6).

Students value flexibility in the learning process, which is more conducive to individual development in terms of their learning engagement.

In response to the unprecedented challenges posed by the transition to online learning, both teachers and students need to adapt to meet these challenges by enhancing teaching capabilities, redefining teaching and learning roles, and embracing new learning modes to engage more deeply in College English online teaching.

2) Subtheme 2: The Double-Edged Sword of Technological Infrastructure

Technological infrastructure is a fundamental determinant of student engagement in online learning. Far from serving as a passive tool, it functions as an active, constitutive element of the learning environment that enables, shapes and constrains pedagogical interaction. A well-designed, user-friendly and stable learning environment can significantly enhance student motivation and involvement. When online platforms are intuitive, reliable and supportive of diverse learning needs, students are more likely to engage deeply and consistently with course materials. Features such as stable internet connectivity, accessible content, and collaborative digital tools, including real-time forums and co-creation spaces, not only facilitate individual learning but also foster a sense of community. This, in turn, encourages sustained participation and interactive engagement, transforming the digital classroom from a static content repository into a dynamic, participatory learning space.

Statement 1: Teaching efficiency largely depends on SPOC tools and teaching platforms that provide adequate technological support.

According to the previous literature, technological issues appear to be a significant challenge in online learning across many countries (El-Sayad et al., 2021; Fabian et al., 2022; Wang et al., 2021; Ng et al., 2022). The pandemic in China has rapidly accelerated the development of online teaching technology, including both software and hardware aspects. Overnight, a multitude of SPOC tools emerged, including Tencent Meeting, DingDing Talk, WeChat Enterprise Meeting, QQ Meeting, Zoom, and Microsoft Teams. Teachers had to try, select and ultimately made a decision. Students were required to install nearly all the applications, as different teachers had varying preferences. Following the completion of a term of online teaching practice, Tencent Meeting was primarily the one that endured. Commonly used learning platforms like RainClass and StudyPass were supplemented by subject-specific platforms such as WeLearn and Ucampus for English textbooks. Regarding hardware, teachers endeavoured to upgrade their computers and Wi-Fi devices, and to purchase high-quality cameras and microphones to ensure a good effect on their online teaching.

This has been effective in the classroom and has improved teaching efficiency. It is unlikely to completely return to the traditional teaching mode (T1).

The epidemic has made all teachers proficient in online teaching tools, and students have gradually adapted to this approach (T4).

In online classes, I can use all kinds of software features—like playing videos and marking stuff—that are hard to show fully on a blackboard in offline classes. It makes learning more lively, specific, and easier to get (S2).

The above words suggest that, after an initially overwhelming period of adjustment, there were some positive impacts on online engagement in teaching and learning. Therefore, teachers and students have gradually become accustomed to online learning and no longer feel unfamiliar with it or resistant to it.

Statement 2: The accessibility and quality of learning tools are also crucial.

Learning platforms and software provided by universities or recommended by teachers are generally well-suited for advanced learning. Students living in the digital age tend to favour online learning mode.

Online learning provides me with more opportunities for self-directed learning, allowing me to engage in deep learning at my own pace and according to my interests (S1).

Online learning platforms make learning more vivid, concrete, and easier to understand (S2).

Most students do not encounter significant technical difficulties when using online learning platforms, and many are quite proficient in using them. Before AI became as widely used as it is today, learning platforms seemed to be smarter than traditional classroom teaching.

I can choose the learning content according to my own needs, from vocabulary to grammar, and even more extracurricular expansion, which can be easily obtained (S1).

To our great surprise, learning platforms have helped teachers and schools recognize the importance of personalized learning for students. That is why online teaching remains significant even after the pandemic.

Statement 3: Overcoming some of the negative aspects remains challenging, despite the facilitation of teaching and learning by technological advancements.

Students of the new generation, who have grown up in a digital environment, have quickly adapted to online teaching. However, there are also significant challenges that need to be addressed: difficult supervision, inert interaction and distraction from technology.

Some students may appear to be learning online, but in reality, they may be doing something else because we cannot see their true state through online platforms (T4).

In online classrooms, we cannot know whether students are focused on listening or

doing other things (T3).

The problem with online learning is the lack of immediate supervision and feedback (S7).

Another challenge is the lack of interaction in online teaching. Teacher-student interaction or peer interaction rarely occurs in the online teaching situation.

Screens and the internet have become communication media, but they have also invisibly widened the distance between teachers and students, making real-time feedback in the classroom less smooth (S1).

The absence of quick feedback is demotivating for me, and I worry about being able to maintain this pace (S2).

Direct communication with teachers can better stimulate my learning enthusiasm and thinking activity, but such opportunities are relatively rare in online learning (S3).

Eye contact is almost impossible in online teaching (S5).

In fact, students longed for the interactions, because intermediate feedback, especially the encouragement on the spot could accelerate their learning engagement.

Social media, games, and other online content can divert students' attention from their studies, affecting their focus and productivity (Yashoda, 2025:2466). Distraction from technology also acts as a limitation that impacts OSE. While technology is a powerful learning tool, it can also be a source of distraction for students.

I really couldn't resist all sorts of distractions (S7).

The course content is often not attractive enough to stay focused for a long time (S5).

In the interview questions, the issue of distraction was not given much attention, so few relevant answers were provided. However, it is indeed a significant issue that could potentially exist in online teaching, affecting the level of student engagement.

Technological advancement enhances the level of student online engagement, but it also presents some negative aspects that are worth noticing and discussing.

3) Subtheme 3: Robust yet Potentially Flawed Social Support

In the realm of online education, the establishment of virtual communities is paramount for fostering collaboration, engagement, and a sense of belonging among learners (Peacock et al., 2020). Community engagement lies at the heart of effective online education, providing learners with opportunities to connect with peers, instructors, and experts in their field (Eze et al., 2023). Admittedly, there was a virtual community in College English online teaching in China during the pandemic, forming a learning community that provided social support. A collaborative learning community encourages students to share ideas, ask questions, and learn from each other.

Statement 1: Institutional support ensured the continuity of education.

The government and the university provided significant support for online teaching during that special period. On January 19, 2020, the Ministry of Education of China issued a notice to all educational institutions, stating, "Make use of online platforms to ensure 'to suspend classes without suspending learning'." The university took measures to ensure the implementation of this notice. It purchased learning platforms, provided online teaching training for teachers, upgraded the campus network infrastructure, and required supervision methods to guarantee the smooth operation of online teaching.

They've added all the teachers to a shared online group. This way, we can easily get advice and share tips on how to use the new learning platform (T2).

Because the school really kicked into gear quickly, I can now focus in class without any panic (T3).

In some remote rural areas, the local government made every effort to provide electricity and Wi-Fi signals for families with college students.

My home is in a remote rural area, but power and wi-fi signals are good enough to

ensure my online learning (S7).

The government's commitment and the implementation of constitutions ensured the continuity of education in the face of challenges.

Statement 2: A learning environment can either enhance or impede learning engagement.

During the pandemic, students were dispersed across various locations to engage in online learning. The learning environment underwent significant changes, and students might have taken their classes at home, in dormitories, or even in a hotel.

A quiet learning environment is essential (S8).

Unlike the traditional classroom, the online learning environment significantly impacts students' psychology. A well-designed study space that is comfortable and well-lit can enhance concentration and participation, while a poorly maintained one can lead to distractions and discomfort.

Comfortable seating and bright lighting allow me to focus on online courses (S5).

Conversely, cramped, noisy, or poorly maintained environments can cause interruptions and unease, leading to lower levels of student engagement.

It's hard to keep your focus with all that noise (S5).

I am easily distracted when studying in my dormitory (S1).

The physical learning environment plays a role in enhancing students' learning engagement. Having a quiet, dedicated study area free from distractions enables them to focus better during virtual lessons and feel less mentally fatigued, allowing them to maintain their attention on what they are learning. Comfortable seating, good lighting, and having devices and study materials within easy reach provide them with a clear, consistent routine for learning, making it easier to stay focused and engaged in their online classes.

Statement 3: Peer and family support motivated students to engage more with online learning.

Peer support holds considerable importance and extends beyond the boundaries of the classroom. Lee et al. (2011) emphasized that peer interactions, such as group discussions, group projects, peer teaching, peer tutoring, and peer facilitation, are essential in assisting students to adjust to online learning. Peer support enables students to share expertise, articulate intricate ideas, and acquire collaborative problem-solving abilities. A collaborative learning community encourages students to share ideas, ask questions, and learn from each other.

Teachers, classmates, and family members also have a certain influence on my learning (S2).

The learning community could extend beyond the classroom.

We study together, keep an eye on each other, and cheer each other on. This collaborative learning atmosphere brings out my potential far more than studying alone. (S8).

Furthermore, a competitive learning community could engage students fully in their studies.

When students from the neighbouring dormitory pass the exam, there is peer pressure in our dormitory, which leads to more diligent studying (S6).

Family support appears crucial, yet it is not as significant as expected. Many a student is the only child in his or her family due to China's birth-control policy. Siblings are seldom seen in a family. The role of parents differs from that of siblings. Meanwhile, the younger generation seems more concerned about their privacy and is often reluctant to talk to their parents.

Parents can serve as a bridge between children and teachers, encouraging children to express their own ideas and confusion (S6).

Parents' attitudes and the influence of those around them are also important (S6).

Teachers, classmates and family members also have a certain influence on my learning (S2).

Based on the responses above, the social support from institutions, teachers, families and peers significantly influences students' engagement and success in online education, enabling learners to adjust to and thrive in the evolving environment of College English online teaching.

4.7.3 Theme 2: Internal Drives and Agentic Action in Online Learning

The quality of student engagement in online College English learning is fundamentally shaped by the agentic resources that learners bring to the digital environment and the responses these resources enable. This agency, including motivation, self-efficacy and self-regulation, functions not merely as an internal trait but as the essential mechanism. In an online teaching environment, this mechanism serves as a driving force that impacts various aspects of students' learning. It helps to arouse students' interest and motivation, enabling them to participate in the learning process more actively. It fosters a sense of responsibility and self-discipline among students as they endeavour to meet the expectations set by this mechanism. This, in turn, results in enhanced learning experiences and better academic achievements for students.

1) Subtheme1: Components of Motivation

Motivation is the driving force that propels students forward. Cook (2000) thinks that there are two types of motivation which have been discussed much: integrative and instrumental motivation. Integrative motivation may stem from a strong interest in a specific field or activity, making people eager to immerse themselves and gain a thorough understanding. On the other hand, instrumental motivation is usually related to achieving specific goals, such as promotion or obtaining a certain qualification. Motivation can come from various sources, such as personal interests, the desire to succeed, or the recognition and rewards associated with achievement. It provides students with the energy and focus needed to overcome obstacles and make progress. Cultivating and maintaining motivation is crucial

for students' academic success and personal development.

Statement 1: Personal interest is the internal learning motivation of students.

According to Ellis (2000), intrinsic motivation refers to the drive for learning that stems from genuine interest in a subject or academic discipline. Such motivation tends to be more sustainable and effective over time because it aligns with the learner's personal values and intellectual passions. Students driven by intrinsic motivation are more likely to persist through difficulties, seek deeper understanding, and demonstrate greater creativity in their approach to academic challenges.

I believe that learning English first requires a drive of interest or goals. For instance, improving my English proficiency or achieving a certain exam score can motivate me to be self-disciplined, better manage my learning and maintain focus even without direct supervision (S2).

Some students usually have a strong desire for knowledge, and the purpose of their learning is to satisfy curiosity and thirst for knowledge.

I believe ... that genuine enthusiasm, a good ear for the language, and a real curiosity about the culture behind it are all essential. These are the things that really determine whether I can stick with learning and truly immerse myself in it (S2).

This intrinsic motivation enables students to study in depth and continuously explore, which can positively impact their academic performance. The online English learning environment provides students with greater autonomy over their time and access to a wider array of learning resources. This autonomy and diversity are conducive to the cultivation of their personal interests.

Statement 2: The desire to succeed drives students' engagement in learning.

Students aspire to enhance their skills and qualities, thereby realizing their life values through learning. Personal growth and self-actualization are the driving forces behind their English learning.

No matter what your major is, mastering English is very important because many advanced research documents are in English (S6).

Some students typically have high self-expectations and strong self-discipline. These students tend to advance further on the academic path.

I am a sophomore now and am considering taking the postgraduate entrance examination. I hope to continue my learning in the future. Now the main factor affecting my learning motivation is self-improvement and the desire to improve my English level (S3).

To finish undergraduate education is not the end for most student, but they would like to go further to *improve academic performance (S1)* in the future to fulfil their self-development.

I have the idea of studying abroad, seeing the outside world and experiencing different ways of life (S2).

Therefore, having positive expectations for the future fosters greater student learning engagement.

Statement 3: To get recognized is a practical goal to drive students to study College English.

In China, passing a national English exam, such as College English Test Band 4 (CET-4) and College English Test Band 6 (CET-6) which is designed for advanced students, is essential as it serves as a crucial gateway to employment and further education. During the pandemic in China, CET-4 and CET-6 were delayed, but not stopped. That is why College English students would like to devote themselves to online English learning *to achieve good grades in exams (S2)*. With the intensification of social competition, many college students' learning motivation comes from employment pressure. The increased employment pressure resulting from the epidemic has intensified students' motivation to learn.

Through continuous English learning, I can enhance my abilities and be fully

prepared for future work (S4).

They hope to obtain better career development opportunities and improve their employment competitiveness through study. In order to find a good job after graduation, beyond their major studies, obtaining CET-4 and CET-6 certificates is a mandatory requirement for students.

2) Subtheme 2: Sources of Self-Efficacy

Self-efficacy is crucial for achieving personal and professional success. According to Social Cognitive Theory (SCT), individuals with a high sense of self-efficacy are more likely to undertake challenging tasks, as they believe they possess the skills and resources necessary for success. The coding results indicate that self-efficacy is reflected in students' self-management, task completion and the use of learning tools.

Statement 1: Self-management is an ability embodied in one's metacognitive ability.

In online learning, students must first clarify their learning goals and create a reasonable learning plan. This management ability seems particularly important in the context of online learning.

I allocate a certain amount of time every day to memorize vocabulary and do other learning tasks, such as memorizing at least two hours of vocabulary every day. This arrangement is mainly based on my own study plan and goals (S1).

Students can utilize online time management tools to assist in organizing their study schedules, ensuring the seamless completion of learning tasks. Simultaneously, they should also master the art of allocating study time reasonably to prevent situations where study periods are excessively long or overly short.

I'm usually pretty good about getting to class on time and keeping my schedule organized. But I've definitely had a few troubles, like when something last-minute comes up and I forget to drop the class in time (S5).

Learning goals can be categorized into long-term and short-term objectives. A long-term

goal might involve mastering the knowledge system of a subject, whereas a short-term goal could be completing the learning tasks for a specific unit. When establishing learning goals, students should set achievable objectives that align with their current situations and learning capacities. This is a form of management skill. In particular, in an online learning context, effective time management becomes even more crucial. Regarding time management, students have indicated that online learning offers sufficient flexibility to schedule additional study time, yet they have rated their own time management skills relatively low. To help organise their study schedules, students can utilize online time management tools such as calendars and to-do lists.

I often use time management tools such as to-do lists and my time management skills have been significantly improved (S7).

I learned how to plan my learning tasks and how to allocate my time effectively (S2).

Students need to arrange their learning time reasonably to ensure the smooth completion of learning tasks. At the same time, they should also learn to allocate their study time appropriately, avoiding both excessive and insufficient study durations.

Statement 2: Students' commitment is associated with their proactive performance in task completion.

A student's commitment is linked to their positive performance and task strategy in completing tasks.

I will complete the assignments given by the teacher in a timely manner and strive to finish them in class (S4).

I work hard to complete all tasks within the deadline (S8).

Conversely, the failure to achieve results may lead to students feeling frustrated and withdrawing when faced with difficulties.

I'm not doing that very well (S9).

I can't always complete my homework well (S7).

I did not complete some tasks and assignments (S8).

When learning online, I usually do part of my tasks (S9).

In online learning, students must select suitable task strategies based on the characteristics and requirements of the learning tasks. Positive performance and successful task completion will enhance students' sense of self-efficacy and reinforce their engagement.

I usually develop a phased learning plan, gradually progressing from easy to difficult (S4).

On the contrary, non-accomplishment may lead to students' frustration and withdrawal from difficulties.

I think we can probably complete 60-70% of it (S6).

I find some tasks too complicated, and I don't have the motivation to do them (S7).

Every now and then, something comes up that's beyond my control, and there's just no way to finish by the deadline (S8).

In short, commitment serves as a key predictor of proactive behaviour in students' task performance.

Statement 3: Self-confidence originates from proficiency in utilizing online learning tools.

Online learning for students inherently requires the use of online learning tools, including apps and learning platforms. The students' perception of the ease of use and usefulness of these online learning tools, as well as their proficiency in using them, is instrumental in enhancing online learning efficiency.

I still have confidence in my online learning ability and can proficiently use these

tools to help me solve learning difficulties. I usually try to use online tools to find relevant explanations and example sentences to help me better understand these complex sentence structures (S3).

These platforms are usually designed to be relatively simple and easy to use (S2).

In the event of technical issues, students can promptly seek assistance from teachers, classmates, or technical support staff. Students select their learning resources according to their individual learning objectives and requirements.

I can effectively solve this problem through screening and communicating with my peers (S3).

When choosing learning resources, students can refer to teachers' recommendations, classmates' evaluations and rankings of online learning platforms.

Yes, running into that kind of problem is just part of filtering through information (S4).

At the same time, students also need to learn to manage their own learning resources, such as organizing favourites and creating study notes, in order to make better use of learning resources. From the interview, students are generally confident in familiarizing themselves with and using the Electronic Learning Management System.

3) Subtheme 3: The Role of Self-regulation

Online self-regulation refers to an individual's ability to control and manage their own behaviour and actions while using the internet. It plays a key role in ensuring a healthy and productive online experience. In the context of coding, there are two aspects particularly worth noting in online learning: self-discipline and autonomous learning.

Statement 1: Online teaching requires students to have a certain degree of self-discipline.

Several students maintained that they had not strong self-discipline in online learning in

the interview.

Sometimes, I find it difficult to resist the temptation of checking my phone, even when studying, I unconsciously pick up my phone (S4).

Sometimes it does get distracted by entertainment software (S7).

Students often struggle with self-discipline when they first engage in online learning. Poor self-discipline can subsequently undermine their learning outcomes. This demands teachers' supervision and guidance.

I tried to overcome these problems, like using tools like Tomato Bell to help myself stay focused (S7).

After thinking it over and making some adjustments, I started trying to understand English in a more open and flexible way (S6).

When students are aware of setting learning goals and stay alert about achieving their goals step by step, along with the teacher's feedback, they gradually perform better in this aspect.

Statement 2: Metacognitive learning strategies lead to autonomous learning.

Autonomous learning is involved in self-directed learning in online learning environments. The concept of autonomous learning is consistent with metacognitive learning strategies.

I'm good at getting my online assignments in on time, and I also set my own learning goals to stay motivated. For instance, I make a point to memorize a set number of words each day, or get through a certain amount of reading from English articles. Having these specific targets really helps me stay on track and know exactly what I'm working toward (S1).

A remarkable characteristic of autonomous learning is being responsible for one's own learning. It is an ability and attitude for independent learning and a control over one's own learning content. Metacognitive awareness directly strengthens learners' ability to regulate their own learning, which is the key feature of autonomous learning.

I take charge of my own learning. I keep an eye on how I'm doing, and I'm not afraid to change my study methods if something isn't working (S3).

One who can take responsibility for their own learning must be adept at managing their learning as well. To some extent, such students are consciously or unconsciously employing metacognitive learning strategies to direct their learning. Successful learners proficient in utilizing metacognitive strategies can independently organize, monitor and adjust their learning processes.

During exam preparation, I will create study plans specifically for English speaking, writing, translation, and reading, and search for high-quality course resources on various learning platforms for study (S2).

Autonomous learning in this study refers to learners' ability to self-direct and develop an independent, proactive approach to their studies. This involves taking control and responsibility for their own online learning, determining both the content and the methods of their education.

My autonomy and sense of control are actually quite limited in this regard (in online learning during epidemic period) (S4).

I am very accustomed to this method of self-directed learning (S3).

Students interviewed believed that online teaching emphasized the necessity for learner autonomy, as teachers were unable to monitor learners' activities in real-time, both inside and outside the classroom. Those with high metacognitive abilities can formulate detailed study plans, manage their study time effectively, and ensure the timely completion of study tasks. They can also conduct self-assessment and self-supervision. On the other hand, those who have difficulty with metacognitive awareness are unable to manage online learning effectively and lack the ability for autonomous learning. They rarely evaluate their own learning progress, leaving the entire learning process in a state of chaos.

From the responses above, it is evident that the effectiveness of online learning relies on three core elements: motivation, self-efficacy, and self-regulation. These factors shape

student engagement through intrinsic mechanisms. When these mechanisms operate positively, learners will certainly achieve strong academic results. On the contrary, students with underdeveloped intrinsic mechanisms are likely to face difficulties in online College English classes. Therefore, motivation, self-efficacy, and self-regulation are crucial for a successful online learning experience, especially in situations where real-time teacher monitoring is not possible.

4.7.4 Theme 3: Toward Balanced Sustainability in the Evolving Online Teaching Ecosystem

When external factors, such as technological advancement and social support, are effectively integrated with internal factors like motivation, self-efficacy and self-regulation, students are more likely to achieve their academic goals. However, an imbalance or lack of coordination between these elements may hinder the learning progress. The study of how to keep balance between the two types of factors can significantly influence the overall student online engagement.

Sustained online student engagement is not the automatic result of favourable conditions or strong individual traits, but is actively cultivated through deliberate mediating processes that connect the external learning environment with the learner's intrinsic mechanism. When external supports, such as reliable technology and responsive social structures, are pedagogically aligned with internal drives like motivation and self-regulation, they create a synergistic ecosystem conducive to deep learning. Conversely, an imbalance or lack of coordination between these elements may hinder the learning progress. The study of how to keep balance between the two types of factors can significantly influence the overall student online engagement.

1) Subtheme 1: The Highly Praised and Central Functions of Teachers

Teachers play a crucial and diverse role in fostering student engagement in online learning. Their presence, guidance and support are fundamental for motivating students and encouraging active participation. This significant influence is directly reflected in student feedback, where discussions about "teachers' influence" were a prominent theme. Students'

interviews highlighted specific aspects of this influence, categorizing it primarily as "teachers' guidance", "teachers' impact", and "teachers' support". Through methods such as providing timely feedback, offering encouragement, and inspiring collaboration, teachers enhance students' confidence and motivation. Ultimately, it is this direct influence from teachers that enables students to fully engage with and benefit from their online learning experience.

Statement 1: Teachers had to transition from in-person to online teaching to enhance their teaching efficiency.

Of the five teachers interviewed, four expressed a preference for traditional offline teaching, as it is a method with which teachers are more familiar.

As a senior teacher, I personally prefer traditional face-to-face teaching because I enjoy the atmosphere in the classroom. Face to face teaching allows me to directly observe students' facial expressions and eye contact, and understand whether they have mastered the knowledge (T4).

In-person classes indeed possess certain advantages. Teachers can move about freely, capture students' attention at any time, pose questions and conduct group activities, all of which are highly flexible. Moreover, face-to-face interaction cultivates a stronger sense of connection, which is extremely beneficial for teaching effectiveness.

Both students and teachers generally believe that face-to-face communication is more effective because it is more direct and feels more human (T5).

Teachers still have doubts about the new teaching mode.

In online teaching, everyone is facing the computer screen, lacking real communication between people (T5).

How to make students active and help students better absorb knowledge remains a challenge (T4).

Since the teaching was entirely conducted online, teachers had to adapt to online instruction. It takes time for teachers to fully embrace new things.

Online teaching breaks the limitations of traditional 45-minute classrooms and can utilize online resources (T3).

As modern educators, many teachers have demonstrated great courage in embracing the challenges of online teaching. They have rapidly adapted to unfamiliar digital platforms, acquired new technical skills, and redesigned lessons to suit virtual environments—all while maintaining clear communication and providing emotional support for students.

Statement 2: Teachers can stimulate students' self-efficacy by providing appropriate guidance on how to learn English.

Teachers' guidance is highly significant for students in terms of self-efficacy. Teachers can formulate personalized learning plans for students based on their actual situations, enabling students to gradually reinforce their self-confidence while achieving small goals.

The teacher provides some directional guidance and suggestions to help us better plan online learning (S1).

A teacher's guidance is crucial. With all their experience, they can pinpoint which resources are actually helpful, which keeps students from getting lost in a sea of information (S1).

In order to motivate students to perform well in online classes, College English teachers have made great efforts to assign various learning tasks to students, such as *submitting classroom notes* (S1) and taking a *five-minute quiz* (S2). In China, teachers rarely complain about their online engagement. WeChat almost occupies most of their spare time for answering students' questions. Whenever they are needed online, they are willing to respond immediately. Though not in a real classroom, students can obtain teachers' guidance without difficulty.

My teacher recommends me some practical, functional, and valuable platforms for

English learning based on her own experience (S9).

The teacher's guidance is the key to setting the learning direction and reducing detours (S7).

During the pandemic in China, most College English teachers were unselfish enough to offer their guidance to students. They were really the loveliest angels.

Statement 3: Difficult interactions lead teachers to devote more effort to maintaining students' attention.

The screen and the internet have become the medium of communication. However, they have also subtly widened the distance between teachers and students, making real-time feedback in the classroom less smooth.

In online classes, there is relatively less interaction between us (S3).

Not getting quick feedback or interacting much really kills my motivation. It's hard to keep going long-term. (S1).

Maintaining focus is indeed difficult (T3).

Unsatisfactory interaction reduces the level of engagement in learning. Teachers devoted more effort to maintaining students' attention. They tried to *prevent students from being distracted and determine whether they are truly involved* (T1). Sometimes, students were *not very cooperative* (T5). Given these difficulties, most teachers felt it was their responsibility to take measures to address them. They changed their teaching methods to alleviate student anxiety, ensuring a smoother learning experience.

The teaching methods can be more innovative and diverse (S2).

In online classes, teachers' question-and-answer sessions give me quick feedback. This really helps me understand what I'm learning and keeps me motivated (S4).

The teacher told us English is necessary for academic research, and that made me

more determined to learn it well (S6).

Meanwhile, teachers made full use of the functionalities of learning platforms to enrich teaching content and attract students.

The teachers suggested a few great platforms for learning English—ones they've found to be really practical and useful (S1).

Teacher incorporated elements such as virtual animations, special effects, or sound changes to make the classroom livelier and more interesting (S2).

As a result, students were relieved from anxiety and engaged better in their learning.

Statement 4: Teachers can enhance students' self-confidence and sense of achievement by praising and rewarding them.

In the online English teaching environment, teachers lacked the opportunity for the spontaneous, in-person interaction of a physical classroom. Furthermore, some students felt indifferent toward their teachers.

In online classes, teachers can't keep track of every student as well as they do in person (S2)

It's hard for them to watch everyone's video at the same time, so keeping an eye on how we're doing is tough (S2).

However, College English teachers tried to provide emotional support by promptly responding to students' messages and showing concern for their studies and lives. When students encounter difficulties in study, teachers can encourage students not to give up and offer some suggestions and ways to solve problems.

My teacher gave me a lot of encouragement and advice. He told me to study hard, make good preparation for future, and strive to achieve my goals. What he said really meant a lot to me (S2).

Teachers can also enhance students' self-confidence and sense of achievement by praising and rewarding them. When students make progress, teachers can give timely recognition and praise, so that students feel that their efforts have been recognized.

I often give extra points to students who perform well (T4).

Teachers also address students' problems promptly through online Q&A sessions, enabling students to sense the teachers' attention and support.

My teachers really care about how I'm doing in my studies. They catch my problems right away and help me with exactly what I need (S6).

Students' self-confidence and sense of achievement are the necessary conditions for student learning engagement.

2) Subtheme 2: Evolving Online Teaching Management

Online teaching management plays an important role in online student engagement. During the pandemic in China, College English teaching management experienced significant changes. Pedagogical strategies needed to be innovated to align with advanced technological learning tools and the changed learning environment.

Statement 1: Instructors placed greater emphasis on the teaching content in the online environment.

The teachers used various ways to present teaching contents. They integrated images, videos, audio and interactive elements to increase student engagement.

Preparing the teaching content itself isn't the hard part. The real challenge is figuring out how to teach it online (T5).

Since we can't see the student's faces, it's tough to make the class feel lively and interactive (T4).

When you looking at the screen for a long time, especially in a one-to-many

environment, it is really easy to lose focus (S5).

Our classes are huge—like, 60 or 70 students—so we can't possibly keep track of everyone (T4).

Precisely because online courses present the various challenges and difficulties mentioned above, teachers have made even greater efforts to prepare their online classes.

Statement 2: Various strategies were adopted to sustain students' motivation and concentration in online College English courses.

Teachers also employed different methods to ensure that students remained motivated and focused in online classes. These methods included providing positive feedback, utilizing the software's random roll-call function, and administering regular quizzes.

To make up for the lack of live explanation, I can track students' viewing time in the background and use that as part of their participation grade. I've also started recording myself explaining the practice problems and uploading each lesson to the platform, so students have to watch them to complete the unit (T1).

Online learning breaks this limitation and provides more abundant and diverse resources (S1).

The key point is to inspire students' motivation and attract their attention in online learning. Naturally, online teaching management is closely associated with the interaction between students and teachers. This is a point that the interviewed teacher often mentioned.

Statement 3: Meaningful interaction with students was difficult in the online environment.

Teachers expressed that the difficulty of online interaction corresponds to that reported by the interviewed students.

Students are not very willing to turn their cameras on (T1).

Online classes do have interactions, but they're not as lively as the ones in traditional classrooms (T4).

In online classrooms, this kind of instant communication is relatively difficult (S4).

Though teacher-student interaction is difficult in online teaching, yet teachers made their efforts to explore the ways to break through the hurdles. Some teachers required *students to listen to the lectures with tasks, and uploaded their photos, listening notes immediately after class (T1)*. Some teachers simplified the ways by asking students to *type 1 or 2 to their yes or no for a statement or an opinion (T3)*. In a small class (about 30 students), *classroom discussions are done through chat boxes, or direct voice communication (S7)*.

The exploration is still ongoing and has offered a great deal of valuable experience even after the pandemic.

Statement 4: Supervision was needed in the online environment.

As noted in the introduction, the university selected for this study is a mid-tier institution in China. Based on this institutional positioning, it can be reasonably inferred that the student population, on average, represents a moderate academic and self-regulatory profile, characterized by an intermediate level of self-control.

I think supervision is key. You really see its value with students who are having a tough time or just don't feel like learning, but they have to. In those cases, that extra oversight is a huge help (S3).

I also need the supervision of my teachers or classmates to complete the study tasks and homework (S9).

Most teachers were greatly concerned about students' learning process and achievements.

We cannot know whether students are focused on listening or doing other things (T3).

As a result, they paid much attention to online teaching supervision. They made use of the attendance function in the teaching platforms to *record students' learning status (T1)* to

ensure the attendance. In the process of teaching, some teachers asked some students to *turn on their cameras* (T3) to see whether he / she was online.

You can really tell who's grasping the material during question-and-answer part.
Some students are always ready with great answers, while others tend to stay quiet (T3).

Therefore, supervision is truly necessary to enhance student learning engagement.

3) Subtheme 3: Adaptive Assessment

Assessment is not merely a tool for measuring learning outcomes; it is also a means to stimulate active student engagement in learning. In the context of College English online teaching during the pandemic, assessment has assumed a new significance. It is no longer merely a means to an end, grading students according to their performance, but rather a dynamic process that encourages students to actively interact with the material and take charge of their learning.

Statement 1: Formative assessment rather than summative assessment was emphasized.

The College English courses examined in this study follow the principle of integrating formative and summative assessments to evaluate students. The outbreak of the pandemic provided a significant opportunity to continue with formative assessment.

In the College English course, the assessment consists of formative and summative parts. The formative assessment includes various online tasks in Reading, Listening, Speaking, and Writing, which are carried out on learning platforms and tools such as UCampus (a learning platform for English Listening and Speaking) and Speexx (a Comprehensive English Self-Study Platform), accounting for 50% of the total grades. The summative assessment is the final examination, making up 50% of the total grade. However, during the pandemic, the proportion of the final exam scores was reduced to 30%, significantly increasing the weight of ordinary performance such as coursework, attendance, and the completion rate of UCampus.

By incorporating a variety of assessment methods, such as peer evaluations, self-assessments, and project-based assessments, teachers can create a more interactive and engaging learning environment that fosters a deeper understanding of the material and promotes critical thinking skills. Teachers placed greater emphasis on formative assessment rather than summative assessment, due to the inconvenience of implementing final examinations during the pandemic period.

I will arrange self-review sessions for each class, allowing students to complete quizzes or other tasks to see if they've really got the knowledge down (T2).

On an online learning platform, it is convenient to design tasks for students to answer quickly, such as *True or False questions, multiple-choice questions* (T4). Students must dedicate more effort to their daily studies.

We need to regularly review what we have learned during this time, and evaluate our learning effectiveness and progress (S8).

Otherwise, even if they achieve good grades on the final examination, they might still fail. In comparison with offline teaching, teachers are more involved in designing and evaluating learning tasks.

Statement 2: The first large-scale online final examination was a significant challenge, but it was completed successfully.

Non-English majors in their first and second years are required to take the College English final exam at the end of each term. During the initial online exam, both teachers and students experienced considerable anxiety. Students were instructed to use two devices:

One for answering questions and another for monitoring (T3).

While it was indeed challenging to monitor the situation of every student, this method was a response to conducting exams during the pandemic. Rehearsals were conducted twice to ensure everything was well-prepared. The examination was administered on an online teaching platform. However, it was not possible to display dozens of faces on one screen

simultaneously, making it difficult for teachers to monitor all students at once, as they could in a classroom setting.

According to an interviewed teacher, the online teaching platform could meet the majority of teaching needs, but there was still room for improvement, particularly in terms of technological support for enhancing teacher-student interaction and teacher oversight of students. Overall, the final examination was successful, but some teachers held the idea that *may not fully reflect the teaching effectiveness (T2). In order to relive huge pressure on student (T3).*

The difficulty level of the examination questions was reduced, resulting in most students achieving ideal grades.

The grades are generally high, but it is hard to say that the teaching effect is good, because the test questions are relatively simple (T2).

From the students' interviews, it was observed that anxieties and pressures associated with final online examinations were alleviated by the support provided by institutions and teachers during Emergency Remote Teaching.

In conclusion, through a reflexive analysis of the data, this study constructs a core interpretation: the effective engagement and learning outcomes of online College English learners are facilitated by the complex interplay of three thematic dimensions: the external context, internal drives and the pursuit of balance and sustainable development. This interpretive finding demonstrates that successful online learning is not determined by a single factor, but emerges from the dynamic inter-construction of internal and external elements within a specific teaching-learning ecosystem. This addresses the study's central inquiry into "intrinsic mechanisms" and "ecological balance", outlining a foundational view of online College English teaching as an organic and dynamic system.

4.8 Integration of Qualitative and Quantitative Findings

The qualitative and quantitative findings intersect in ways that both align and differ,

offering complementary perspectives on student engagement during crisis-driven online learning. Taken together, they point to engagement as an outcome shaped by the interaction between student's own agency and the broader educational ecosystem.

4.8.1 Confirming and Deepening Core Insights of Student Self-support

The qualitative narratives (Theme 2) provide in-depth validation for the most significant quantitative finding: that student self-support encompassing motivation, self-efficacy, and self-regulation is the strongest and most consistent predictor of engagement across all dimensions. Meanwhile, it also reveals students' vulnerability in these aspects. Qualitative study found College English students' engagement in online learning is frequently driven by instrumental motives, such as the pursuit of high exam scores (S2) and the pressure to enhance future employability amid intensifying social competition. This externally motivated commitment, however, often coexists with notable self-regulatory challenges. While students appreciate the scheduling flexibility that online learning affords, they simultaneously report relatively weak time management and self-discipline. Their persistence appears closely tied to perceived progress; successful task completion reinforces effort, whereas setbacks often lead to frustration and disengagement.

Metacognitive ability emerges as a critical differentiator. Learners with stronger metacognitive skills proactively plan, monitor, and adjust their learning, ensuring steady task completion and sustained involvement. In contrast, those with limited metacognitive awareness struggle to organize the learning process, rarely self-assess, and often experience their learning as ineffective. Interviews with high-performing students, such as S2 and S3 (both of whom achieved high scores on the CET-4 exam), clearly illustrate this link. These students not only reported high motivation but also demonstrated strong metacognitive management, planning their study schedules, actively monitoring their comprehension, and adjusting strategies as needed. As S2 noted, *"During exam preparation, I will create study plans specifically for English speaking, writing, translation, and reading, and search for high-quality course resources on various learning platforms for study."*

"I take charge of my own learning. I keep an eye on how I'm doing, and I'm not afraid

to change my study methods if something isn't working" (S3).

This self-regulatory gap creates a dependency on external guidance, as learners rely on teacher supervision to compensate. This also accounts for subsequent qualitative-quantitative discrepancies over teacher support.

4.8.2 Revealing Critical Divergence on Teacher Support

A key and revealing divergence emerged concerning the role of teacher support. Quantitatively, teacher support failed to register as a statistically significant predictor of engagement in the regression models. In stark contrast, it emerged as a dominant and recurring theme in the qualitative interviews, as detailed in Subtheme 1, Theme3: "*The Highly Praised and Central Functions of Teachers*". Students consistently described teachers as vital, multi-faceted sources of support in the fragmented online learning landscape. They were portrayed not merely as content deliverers but as crucial providers of emotional reassurance, personalized guidance, and the structured rhythm necessary to navigate uncertainty. This sharp discrepancy suggests that the standardized survey instrument, designed to measure predefined constructs like resource provision and feedback timeliness, may have failed to capture the adaptive dimensions of teacher support that became paramount during the crisis. Qualitatively, effective teacher support was defined less by technical metrics and more by perceived availability, empathetic communication, and the capacity to foster a human connection—elements that are inherently difficult to quantify yet were central to the student experience. Thus, the mixed-methods approach reveals a critical limitation of the quantitative measure while highlighting that teachers played a profoundly important role that was qualitative in nature: one of relational and adaptive pedagogy rather than a statistically isolated input.

4.8.3 Confirming Systemic and Contextual Factors

The findings regarding external support factors demonstrate a notable convergence between the quantitative and qualitative data, providing a more complete picture of the learning environment.

Both methodologies align in their assessment of institutional support (e.g., academic policies, flexible assessment adjustments, and technical infrastructure) and family support (e.g., providing a quiet study space, emotional encouragement, and material resources) as crucial contextual enablers. Quantitatively, these factors showed significant, though often modest, positive effects on engagement. Qualitatively, students explicitly affirmed their importance, describing them as foundational prerequisites that either facilitated or hindered their ability to engage consistently (see in Subtheme 3, Theme 1: *Robust yet Potentially Flawed Social Support*). This consistency confirms that while these external supports may not be the primary drivers of engagement, they are essential facilitators that create the necessary conditions for learning to occur.

Similarly, both datasets converge in revealing the limited role of peer support. Quantitatively, its predictive influence was confined to interactive engagement and was non-significant for overall outcomes. It focused on emotional solidarity or technical troubleshooting support rather than deep academic collaboration. Qualitatively, students only mentioned the benefits of peer support and its role in modelling positive behaviours, and they also noted that there were relatively few collaborative tasks in the classroom. This dual-method evidence strongly suggests that, within the emergency remote teaching context, peer support was a passive byproduct of the situation rather than a feature of pedagogically designed collaborative learning, explaining its minimal overall impact on engagement.

Furthermore, the qualitative narratives enriched the understanding of technology's role, revealing its dual and often contradictory nature (in Subtheme 2, Theme 1: *The Double-Edged Sword of Technological Infrastructure*). While students acknowledged the convenient access to learning materials and asynchronous flexibility that technology provided, they equally highlighted its function as a major source of distraction. The blurring of boundaries between study and personal life on the same device, combined with unengaging online sessions, led to the fatigue. It meant that the very technology that enabled access simultaneously posed a significant barrier to sustained cognitive and behavioural engagement. This critical insight of technology as both an enabler and an

impediment adds essential depth to a purely quantitative measure of "technology access" or use.

4.8.4 Identifying Levers for Improvement

The qualitative findings offer concrete, student-informed guidance for improving the learning ecosystem (Theme 3). They highlight the need to address the common challenges of isolation and distraction in online settings, pointing toward necessary adjustments in pedagogy rather than just technology. Specifically, the data suggest three key interconnected strategies: designing interactive courses that foster active co-creation, adopting flexible and authentic assessments that value process and adaptability, and cultivating supportive, consistent teacher-student interactions.

These strategies work together to promote the student self-regulation and intrinsic motivation that the quantitative data show are central to engagement. For example, interactive course design offers structured practice and feedback, which can strengthen self-efficacy. Flexible assessment can lower anxiety and support psychological safety, encouraging deeper academic involvement. Importantly, consistent teacher-student interaction provides scaffolding and mentorship, helping students internalize self-regulated learning behaviors. Qualitative findings expand the core quantitative emphasis on self-support into actionable guidance, highlighting supportive learning settings as vital for building engagement-fueling self-regulation.

In conclusion, the integration of methods reveals that engagement was not merely the sum of supportive factors, but the active exercise of student agency within a strained ecosystem. The quantitative data identified the *what*, the significant statistical relationships, while the qualitative stories explained the *how* and *why*, revealing the lived experiences, unmet needs, and human complexities behind the numbers. This synthesis provides a solid foundation for discussing how to build a more coherent and resilient online learning ecology that actively fosters student engagement.

Chapter 5 Discussion

This study presents a detailed account of how Chinese College English learners engaged in online learning during the COVID-19 pandemic. While overall student engagement levels were moderate, the observed patterns identified in this study challenge several established assumptions in the online learning literature. Rather than focusing solely on description, this chapter considers possible interpretations of the findings. It argues that online student engagement (OSE) in this setting is best understood not as a manifestation of intrinsic motivation or autonomous learning, but as an adaptive survival strategy employed by learners navigating a system characterized by persistent teacher-dependence, layered but inefficient external supports, and a predominance of instrumental motivation. The discussion first reconfigures the very nature of engagement observed (5.1), then deconstructs the differential and often limited roles played by multi-layered supports (5.2) and the internal mechanisms driving student behaviour (5.3). Ultimately, it synthesizes these insights to propose an integrated, crisis-informed theoretical framework (5.5, 5.6) that challenges and extends existing understandings of student engagement in digital learning environments.

5.1 Reconfiguring Online Learning Engagement in the Chinese College English Context

Although online learning environments are often assumed to support active learning, engagement here often reflects cognitive compliance, namely, students completing tasks dutifully but with limited deep interaction or critical inquiry. Demographic variables such as gender or academic discipline appeared to play a secondary role, serving more to contextualize engagement than to determine it. The core dynamic is the students' dependence on teachers for guidance and affirmation, beyond mere instruction.

5.1.1 The Passive-Active Tensions in Online Student Engagement

The present study reveals a moderate level of student engagement in College English online teaching during the pandemic ($M = 3.45$), characterized by a clear hierarchical

structure: interactive engagement > affective engagement > behavioural engagement > cognitive engagement. While affective and behavioural engagement occupy intermediate positions, their greater dispersion indicates significant individual variation in their influencing factors. This pattern provides a solid analytical foundation for understanding student participation and its determinants in the college English learning context.

Our findings confirm that well-structured curriculum design and teachers' real-time guidance are crucial for fostering deep cognitive engagement (Subtheme 1, Theme 1; Subtheme 3, Theme 3), consistent with prior research (Deka, 2021; Huang & Wang, 2022; Jayanthi & Rajalakshmi, 2022). However, deeper analysis reveals that students' intrinsic motivation and self-regulated learning skills are equally essential drivers of deep cognitive processing. Notably, behavioural engagement declined sharply when explicit external structures—such as detailed task instructions—were absent. While sustained behavioural engagement (e.g., consistent participation) provides a necessary platform for cognitive engagement, it does not automatically lead to deep learning without internal self-regulation. This underscores the foundational role of external scaffolding in online environments (Li et al., 2021) and raises a critical pedagogical question: how can educators effectively balance external support with the cultivation of students' intrinsic capacities?

Furthermore, while previous literature has largely linked affective engagement to relational and supportive factors (Huang & Wang, 2022), our study observed that in online learning tasks, high-quality behavioural engagement (e.g., timely feedback) and cognitive engagement (e.g., metacognitive strategy use) themselves enhanced learners' sense of belonging and satisfaction. This suggests that affective engagement is not solely an outcome of social support but can also emerge from meaningful cognitive and behavioural involvement. Such reciprocal relationships among engagement dimensions extend beyond linear cause-and-effect models and better reflect the complex, dynamic interactions inherent in any learning system (Ciudad et al., 2023).

The observed engagement hierarchy reveals a fundamental passive–active engagement paradox. Students are most engaged in teacher-led interactions, derive affective support from simple affirmations, and generally meet behavioural expectations. Yet, in areas

requiring self-planning, deep thinking, and self-monitoring, their engagement declines markedly. Qualitative evidence highlights that limited self-regulated learning skills (Subtheme 3, Theme 2) foster a strong dependence on external guidance. Where self-regulation is underdeveloped, students rely heavily on teacher direction and supervision (Subtheme 2, Theme 3: Statement 4: "supervision is needed in the online environment") to maintain focus. Although interactive engagement scored highest ($M = 3.61$), driven largely by teacher-led synchronous activities, these interactions were often procedural rather than cognitively generative—sustaining participation without deepening academic discourse. This points not simply to learner deficits, but to a systemic tendency toward teacher-dependent participation that prioritizes compliance over self-regulation.

This configuration is not unique to our study. Multiple studies conducted in the Chinese context (Feng, 2020; Yang, 2022; He & Zhou, 2022) corroborate a persistent cognitive engagement gap, wherein metacognitive behaviours such as goal-setting and self-monitoring remain underdeveloped. During emergency remote teaching, many students met behavioural requirements—logging in, submitting assignments—without internalizing learning objectives or actively self-regulating. Their engagement was thus reactive, sustained primarily by instructional scaffolding rather than proactive agency.

This structural dependency helps explain why student self-support emerged as the strongest unique predictor of overall engagement in our analysis. Without adequate self-regulatory capacity, students struggled to transfer their engagement from teacher-mediated to autonomous learning settings. This finding aligns with broader evidence: studies such as Sum et al. (2021) and Xu et al. (2025) report decline in emotional and cognitive engagement online despite stable behavioural participation, while Aguilera-Hermida (2020) questions whether the online medium inherently supports deep cognitive processing. Nevertheless, low cognitive engagement is not an inevitable feature of online learning. For instance, Hajedris (2021) observed relatively high cognitive engagement among Saudi learners, underscoring that outcomes depend on contextual and cultural configurations rather than technological determinism.

Taken together, this study not only supports prior literature on the drivers of each engagement dimension but also illustrates how these factors interact within a dynamic system. For example, teacher support, typically considered a behavioural driver, can enhance task completion while simultaneously boosting self-efficacy (a cognitive driver) by satisfying competence needs, which in turn promotes positive affective experiences. This ripple effect implies that optimizing single factors in isolation, such as focusing exclusively on social interaction, yields limited returns. Future instructional designs should therefore adopt an integrated, multidimensional perspective, intentionally crafting learning environments that trigger positive cascades across cognitive, behavioural, and affective domains.

The pandemic served as an ecological disruptor, amplifying pre-existing constraints such as diminished spontaneous interaction, unequal technological access, and the abrupt loss of minimal face-to-face support. Within this strained ecosystem, the fragility of students' self-regulatory capacity made the learning environment critically dependent on teacher-led structures to maintain even baseline engagement.

The instructional implication is clear: merely increasing the frequency of synchronous sessions or teacher-student interaction is insufficient to bridge the cognitive engagement gap. Instead, what is needed is the systematic integration of metacognitive scaffolding into course design. This involves explicitly cultivating students' skills in goal-setting, progress monitoring, and self-evaluation. Accordingly, we recommend that online course designers deliberately combine strategies: promoting cognitive engagement through clear objectives and challenging tasks (Deka, 2021), while embedding structured social activities to simultaneously foster behavioural participation and emotional connection (Ciudad et al., 2023). Such an integrated approach can help activate the synergistic effects highlighted in the literature, thereby offering more holistic and systematic support for student engagement.

5.1.2 Demographic Variables as Contextual Differences Rather Than Drivers

Although demographic variables, gender, academic major and year of study, were treated as control variables in the primary regression models, supplementary difference analyses

were conducted to examine whether they produced systematic variation in online engagement. The results showed statistically significant but substantively modest effects. Male students and science majors reported slightly higher interactive and affective engagement compared to female students and humanities majors, respectively. This may raise questions about whether the online pedagogical approach, or the nature of the tasks, resonated more with the typical dispositions or expectations of students in male or science disciplines. Crucially, however, these differences were small in magnitude and did not alter the primacy of self-support as the strongest predictor of engagement. Of particular theoretical significance is the null finding regarding academic year of study: no meaningful differences emerged across year- of- study levels. This aligns with Zou et al. (2021) and suggests that, with this crisis-induced context, engagement functions less as developmental progression indexed by seniority and more as a state-like response contingent upon current self-regulatory capacity and support structures.

These findings foreground the conceptual and empirical ambiguity that continues to surround demographic predictors in online learning research. Gender effects, for instance, remain deeply inconsistent across the literature. While some scholars report higher engagement among female students, particularly in communication-intensive settings (Wu & Teets, 2021; Li et al., 2023; Banihashem et al., 2021), others document equal or superior engagement among male students under comparable conditions (Owusu-Agyeman et al., 2021). Such contradictions expose a critical limitation of static, binary conceptualisations of gender in student engagement research. Its impact is contingently constructed and mediated by situational contexts, task design, and socio-interactional dynamics. These factors routinely flattened in comparative demographic analyses.

Similarly, the negligible effect of academic major observed here is consistent with recent empirical work (Zhang et al., 2025). The absence of a clear year-of-study-level effect calls into question the fragmented, piecemeal way existing research has framed academic year differences in online learning engagement. Much of the current literature offers inconsistent, context-specific results, often highlighting divergent engagement patterns across year groups (Baloran et al., 2021) or claiming that senior students are consistently more engaged (Salta et al., 2022). The inconsistency of these findings implies that the

academic year does not function as a universal driver of engagement but interacts with contextual conditions in complex, often unclear ways.

Collectively, this critical discussion underscores that demographic variables such as gender, major, and year of study are not deterministic forces of engagement but are filtered through instructional and social contexts. This explains why their effects are often small, inconsistent and secondary to the primacy of psychological factors like self-support. Pedagogically, this argues that interventions should not be stratified by year of study. First-year and fourth-year students alike may require explicit instruction in goal-setting, planning and self-monitoring skills that are not automatically accumulated through on-campus experience alone.

5.2 The limited and Necessary Multi-Layered Supports in Online Student Engagement

The levels and patterns of OSE in College English Teaching (CET), as discussed above, are closely associated with the multi-layered support system (i.e., influencing factors). While multi-layered supports exist, their influence on OSE is uneven. This section analyses how these support factors predict online engagement in the College English context. Moving beyond the assumption that increased support uniformly enhances outcomes, the analysis reveals a complex ecosystem of direct effects, compensatory mechanisms, and structural interdependencies.

5.2.1. Teacher Support as a Relational Bridge and Instructional Scaffold

A striking feature of the quantitative analysis is the decoupling between perceived presence and predictive power. While all five support factors (student self-support, peer support, teacher support, institutional support and family support) correlated positively with every engagement dimension ($r = 0.5-0.9$), multiple regression revealed that teacher support (TS) failed to emerge as significant predictors of overall online engagement. This outcome points to a mesosystem imbalance. It suggests the complex and sometimes counter-intuitive role of teacher in online student engagement.

This pattern is consistent with that of Fan and Tian (2022), who also reported that university-level foreign language learners (of English and Chinese, respectively) held favourable perceptions of emotional and motivational scaffolding. However, these perceptions did not translate into measurable gains in language proficiency. Such a recurring discrepancy points to a structural disconnect between students' appreciation of affective support and its actual pedagogical effectiveness in asynchronous or low-interaction online environments.

The broader literature mirrors this ambivalence. During the pandemic, teacher support was often emphasized as a stabilizing force amid widespread disruption (Jayath, 2022; Ciudad et al., 2023). However, empirical findings remain inconsistent. For example, Han et al. (2021) reported a negative relationship between teacher support and emotional engagement, contrasting with studies by Li et al. (2021) and Graham et al. (2023), which underscored teacher presence as vital for affective engagement. This divergence may stem from how "teacher support" is operationalised. Han et al. measured it in terms of the stress and confinement associated with strict monitoring, which may undermine autonomy, whereas other studies focused on supportive presence in a broader sense. Indeed, a significant body of research (Li & Xue, 2023; Huang & Wang, 2023; Yam & McKinley, 2025) converges on the importance of teacher enthusiasm, approachability and positive relationships in fostering an emotionally engaging climate. Our findings further illuminate this tension. Teacher support in this context was predominantly affective, with limited extension into learning strategies or collaborative engagement. Students reported positive emotional interactions, yet also noted deficiencies in academic communication and timely feedback. This underscores a conflict that emerged during the pandemic: teachers were often positioned as emotional comfort providers rather than as instructional designers.

Qualitative data reveal that teachers faced a dual challenge. On the one hand, they had to quickly adapt to online teaching under pressured circumstances. As one teacher noted (subtheme 1, Theme 1), *"In the beginning, I did feel it very sudden. Before the school was closed, almost no teachers actually used these (online) tools in teaching"* (T1). With standardized course content, much of the difficulty lay in designing effective online instruction, selecting methods, managing time and curating materials (Subtheme 2, Theme

3). On the other hand, the absence of physical presence in asynchronous environments placed greater weight on the quality of pre-designed learning architectures, requiring teachers to rapidly master new technologies and redesign lessons, often without adequate preparation (subtheme 1, Theme 2). Consequently, teachers struggled to balance emotional and pedagogical roles. Pandemic-related stresses compelled them to invest more in emotional support, increasing workloads in ways less visible in traditional classrooms. This imbalance likely led them to prioritize certain forms of support while overlooking others, resulting in gaps that limited the comprehensiveness of support students received.

It should be emphasized that teacher influence extends well beyond the affective domain. Our qualitative data (Subtheme 1, Theme 3) show that students highlighted various forms of teacher impact, including guidance in structuring learning, influence on overall development, and support in overcoming obstacles. The isolation of the pandemic appears to have heightened students' valuation of emotional support, which helped alleviate psychological stress. Yet, this very reliance on affective support may have come at the expense of pedagogical and instructional support, explaining why teacher support felt significant to students without translating into broader, measurable engagement outcomes. Consequently treating "teacher support" as a monolithic construct is a significant limitation. In reality, it is a multidimensional phenomenon encompassing technical proficiency, emotional encouragement, and instructional design. The overall effect depends on the alignment of these dimensions; a deficit in one area (e.g., poor feedback quality) can negate strengths in another (e.g., high technical skill), making the construct contextually fragile.

The evidence reveals a more intricate mechanism. On the one hand, robust teacher support, especially during disruptive periods like Emergency Remote Teaching (ERT), served as a critical stabilizing force, directly influencing behavioural, cognitive, and affective engagement. On the other hand, studies in specific contexts, such as high power-distance cultures, have documented neutral or even negative impacts, suggesting that well-intentioned support can be perceived as controlling and may undermine student autonomy. This indicates that the quality and nature of support, specifically, whether it is autonomy-supportive versus controlling, are more decisive than its mere presence.

This leads to a critical paradox for online pedagogy: the most effective teacher support in the long term may be that which strategically makes itself less necessary. In sustainable online learning environments, the goal should shift from providing constant, direct mediation to cultivating student self-regulation and peer collaboration. Thus, the central issue is not the significance of teacher support per se, but rather the imbalance between its interpersonal and instructional functions, a tension that became especially pronounced in crisis-era online teaching. The present analysis suggests that teachers often act as a relational bridge, yet primarily scaffold behavioural rather than cognitive engagement. Therefore, the pivotal question is not *if* teacher support matters, but *how*, *when*, and *for whom*. Effective online education requires moving beyond simply offering more support to designing support that is autonomy-oriented, culturally sensitive, wisely applied, and, crucially, aimed at fostering lasting learner independence rather than reinforcing dependence.

5.2.2 Peer Support as Emotional Buffer with Constrained Cognitive Reach

Contrary to its established importance in engagement research, peer support did not emerge as a statistically significant predictor of online engagement in this study. This finding contrasts with studies by Sri Yusriani et al. (2023) and Huang (2023), which identified peer support as a stronger predictor of engagement in undergraduate and postgraduate settings. Such discrepancy underscores a central principle: the salience of support factors is contextually contingent. In conventional higher education settings, where autonomy is high and parental oversight is minimal, peer support and self-regulation naturally assume greater prominence (Huang, 2023; Robinson Jr., 2025). The present crisis context, however, reveals a more constrained role for peers.

Qualitative evidence clarifies this constrained role (Theme1: Subtheme3). Peer influence emerged primarily as a source of emotional support and reassurance, a finding consistent with Yang et al. (2021) and Huang (2023), who note that peers affect learners emotionally and motivationally, not just behaviourally. This emotional function is well-documented. Research consistently affirms that peer support acts as a powerful emotional buffer in online environments, mitigating isolation, anxiety and alienation (Salta et al., 2022; Trust

& Whalen, 2020), a role that became critically important during the pandemic isolation. Interviews in this study confirmed that students primarily reported mutual encouragement and help with stress or minor technical issues, aligning with this buffering effect. Furthermore, the synergistic power of combined teacher and peer support to reduce anxiety and improve proficiency, as shown by Ahmad Tauchid (2025), highlights how a low-stress, collaborative environment can amplify engagement.

However, a clear boundary emerged: peer support rarely extended into cognitive collaboration. While peer support performed relatively well in areas like mutual assistance, role modelling and sharing, it scored lower on collaborative academic tasks. For instance, the item "*Working on online English group projects with classmates benefited me*" received only moderate agreement (73.8%, M=3.69). This aligns with Pratiwi & Priyana (2022), whose study of 406 students found the most negative responses concerned the peer factor in collaborative work. Student interviews in the present study also revealed that peer interactions were notably scarce compared to those with teachers or learning resources, and that substantive collaborative academic activities were virtually absent or rarely initiated.

Three interrelated factors explain this cognitive constraint:

- 1) Cognitive and Linguistic Demands: Effective language collaboration requires advanced proficiency and critical thinking. The compounded pressures of pandemic-induced technical disruption and high cognitive load likely inhibited peer-to-peer academic engagement.
- 2) Ambiguous Cognitive Outcomes: The divergence in peer support's role becomes clear when examining deeper, cognitive engagement. This and other studies (Pratiwi & Priyana, 2022; Yusriani et al., 2023) find that peer support consistently fails to foster genuine co-construction of knowledge. It boosts morale but does not necessarily translate into substantive academic collaboration or deep learning.
- 3) Cultural and Educational Norms: The context is also influenced by educational traditions in China that emphasize individual achievement and competition. Within a framework where academic success is seen as a competitive individual and familial duty,

collaborative behaviours can be inhibited. Students may be reluctant to share knowledge with perceived competitors, seek help to avoid loss of face (丢脸), or provide critical feedback, as such actions conflict with individualistic striving.

In sum, peer support in this study functioned primarily as an emotional buffer rather than a cognitive catalyst. While it effectively reduced isolation and fostered belonging, it rarely evolved into meaningful academic collaboration. This points to a critical design challenge: online learning environments must be intentionally structured to realize the full, cognitive potential of peer support.

5.2.3 Institutional Support as Infrastructure: Necessary but Not Sufficient

Institutional support (IS) emerged as a significant predictor of interactive, affective, and behavioural engagement, a finding consistent with recent scholarship (Khong et al., 2024; Tufail, 2024; Aad et al., 2024; Graham et al., 2023). These studies emphasize the role of IS in meeting students' learning needs, facilitating interaction with peers and instructors, relieving emotional stress, and serving as a key driver of affective engagement. This suggests that while IS contributes to the emotional and behavioural dimensions of engagement, it has limited influence on students' use of cognitive and metacognitive strategies or the mental effort they invest in learning. This view aligns with Graham et al. (2023), who similarly found that institutional support did not significantly predict any of the latent variables associated with cognitive engagement. These results imply that institutions should broaden and deepen their support systems to more effectively promote sustained and multidimensional online student engagement.

The distinct hierarchy of online learning engagement observed in this study, where interactive and behavioural engagement surpasses cognitive engagement, cannot be interpreted in isolation. It must be understood as an outcome shaped decisively by the multi-level institutional ecosystem in which it occurred. This ecosystem functioned effectively to ensure operational continuity, but in doing so, it systematically prioritized logistical stability over the psychological scaffolding required for deep, self-regulated learning.

Firstly, at the macro-national level, robust policy and digital infrastructure, amplified in the Chinese context by a collectivist cultural orientation, provided the essential backbone for a rapid, orderly transition online (Subtheme3, Theme1). This top-down, efficiency-oriented system successfully mandated the platforms and procedures that enabled high levels of behavioural compliance (Behaviour engagement) and teacher-led interaction (Interactive engagement). Paradoxically, this very strength, a strong, directive framework that ensures equitable access and coordinated response, may have inadvertently cultivated a culture of dependency. Students became adept at responding to external directives but were not systematically guided to develop the internal drivers for self-planned, metacognitively rich learning (Cognitive engagement). Thus, the "dependent participant" is not merely a pedagogical artifact but a socio-structural outcome of a system optimized for collective mobilization over individual cognitive autonomy.

Secondly, universities, as the critical mediating layer, extended this logic. Their crisis response focused adeptly on translating national directives into operational stability: providing user-friendly platforms, flexible assessment policies (Subtheme 3, Theme3), and logistical reassurance. This effectively minimized disruption and anxiety, thereby supporting behaviour engagement and interactive engagement in online learning. However, this necessary focus on crisis management came at an opportunity cost. By concentrating institutional energy on operational smoothness and anxiety reduction, the university layer inadvertently crowded out the design of environments for deep learning. It functioned effectively as an "organizational space" (Wang, 2024) for logistical translation but not as an architect of experiences that intentionally challenge and develop students' cognitive self-regulation. The flexible assessments and simplified tools that lowered anxiety (Subtheme3, theme3: *adaptive assessment*) also risked lowering academic expectations and cognitive demand, reinforcing the very engagement paradox they were meant to resolve.

Thirdly, this systemic prioritization of the operational over the psychological is most stark at the individual learner level. While the literature (Graham et al., 2023; Aad et al., 2024; Deep & Chen, 2025; Khong et al., 2024) unequivocally states that sustainable engagement requires institutional support for psychological and social needs, our data reveal a critical

disjuncture: during the crisis, support remained predominantly logistical. Mental health and affective scaffolding were treated as peripheral welfare, not as core educational infrastructure. Consequently, the institutional model succeeded in supporting students' participation in the learning environment but failed to equip them with the self-efficacy and metacognitive strategies to master it autonomously. The system managed the symptoms of dependency (anxiety, disconnection) through operational fixes, rather than treating its cause by fostering intrinsic regulatory capacity.

In conclusion, the engagement hierarchy is a direct reflection of this institutional value hierarchy. A responsive, multi-level support system requires a fundamental re-conceptualization: psychological and affective support must be seen not as an optional supplement, but as an essential infrastructure that enables sustained cognitive engagement. The path from behavioural compliance to deep cognitive investment requires a deliberate shift from a logistics-first to a learner-first support model, where building the internal capacities of the self-directed learner is the central, organizing principle of institutional design at every level.

5.2.4 Family Support as the Emotional Converter from External Resource to Internal Drive

Unlike the formalised structures of institutional support, family support constitutes an informal, yet potent ecological force, functioning as a critical mediator in the translation of external resources into a student's internal drive. The findings of this study, corroborated by extant literature, reveal that this conversion operates through distinct yet interconnected pathways, while also being subject to significant developmental and contextual boundaries.

1) Facilitating Behavioural Participation and Cognitive Engagement

Notably, family support was a significant predictor of both cognitive and affective engagement. This suggests that its role extends beyond mere practical aid; it is instrumental in enabling students to persist through challenging learning tasks and maintain a positive emotional state. The foundation for this influence lies in the logistical and behavioural scaffolding that families provide. By offering tangible resources, such as

quiet study spaces, reliable technology, and structured reminders, families help compensate for the reduced teacher oversight typical of virtual classrooms (Wang et al., 2022; Baroudi & Shaya, 2022). Participants in this study confirmed that such instrumental support effectively mitigated practical barriers to participation (Subtheme 3, Theme 1).

More subtly, however, the familial climate itself plays a critical role. A home environment characterized by warmth, respect and intellectual engagement does more than organize behaviour; it actively cultivates cognitive dispositions such as attentiveness and persistence, thereby fostering deeper cognitive engagement. Taken together, these findings indicate that family support operates not merely as a logistical solution, but as a socializing force that nurtures pro-academic behaviours, attitudes, and emotional resilience.

2) Providing Emotional Scaffolding and Fuelling Internalisation

Perhaps the most distinctive function of family support lies in its role as an emotional converter. It provides a critical buffer against the isolation and stress of online learning, preserving the psychological energy required for sustained engagement (Garbe et al., 2020). This study's data aligns with the model proposed by Rasyida et al. (2022), wherein familial encouragement and respect bolster a student's academic self-concept. It sustains the resilience and positive affect that underpin willing participation, as supported by large-scale findings (e.g., Gao et al., 2021). This enhanced self-belief acts as a mechanism for internalising motivation, transforming external validation into intrinsic drive and autonomous learning. While the direct link between family support and motivational internalisation was less pronounced in the current sample of university students, a point discussed below, the foundational role of family as emotional scaffolding was unequivocally confirmed.

3) Developmental Differences and Contextual Limitations: Qualifying the "Converter"

A critical discussion must acknowledge the contingent nature of this "conversion" process. The literature heavily emphasising the strong impact of family support often draws on younger adolescents (Tian & Hye, 2024; Xie et al., 2025), whose self-regulation is still

developing and who are more directly embedded in the parental sphere. For the university students in this study, the influence of family is more subtle and distal. Their more developed self-management capabilities (compared with younger adolescents) mean family support often shifts from direct supervision to background encouragement and occasional instrumental aid. This developmental difference cautions against over-generalising findings across educational stages.

Furthermore, viewing family support as a neutral or universally accessible resource is problematic. Its efficacy is profoundly mediated by socioeconomic and cultural capital. Disparities in parents' education, economic resources, and even time to invest in supportive practices mean that this "converter" functions with unequal efficiency. Consequently, while family support is a positive factor, it can also inadvertently reproduce existing social inequalities in educational engagement. Therefore, it is more accurately understood in this context as a surface-level, context-sensitive facilitator rather than a deep, universal driver. Its positive role, though confirmed here, is filtered through a lens of family-specific advantages or constraints, a vital consideration for equitable educational policy and a compelling avenue for future research into the intersection of family ecology and digital learning in higher education.

5.2.5 The Central Paradox of Burden and Fragility in Student Self-Support

Unlike traditional classical systems theory, based on niche theory and Bronfenbrenner's PPCT model (1998), this study regards students' self-support as a layer within the support system. This fully illustrates the critical role played by students' internal mechanisms in their engagement.

A defining tension of the multi-layered support system is the paradoxical status of student self-support (SS). Quantitative analysis positions SS as the strongest and most consistent predictor of all four engagement dimensions ($p < .01$ for each). Yet, qualitative data reveal SS to be structurally fragile and unevenly distributed (Subtheme 1, 2, 3, Theme 2). The data showed that many students enter online College English courses without the metacognitive tools or emotional resilience to self-regulate effectively, especially under disruptive conditions such as a pandemic.

This "fragile engine" paradox creates a structural dilemma: the students most in need of robust self-support are precisely those least likely to possess it. As a result, providing outside support measures before assessing and establishing student self-support may lead to what can be described as an "engagement placebo". Such outwardly visible and well-meaning interventions fail to deliver meaningful learning benefits for the most at-risk students. This finding aligns with Self-Determination Theory (Ryan & Deci, 2020), which posits that autonomy and competence must be supported from within. External support, however well-intentioned, cannot substitute for an internal regulatory core.

Thus, the data expose a dual disruption. First, there is an ecological imbalance. The support system over-relies on SS as the primary engine of engagement while under-investing in its cultivation. Second, there is a mechanistic rupture. The internal architecture of online student engagement (OSE) remains underdeveloped for a significant proportion of learners. The idealized centrality of self-support in policy and pedagogy collides with the lived reality of learner fragility, exposing a systemic misalignment between expectations of autonomy and the actual capacities of students.

This paradox sets the stage for the following discussion, which turns from the ecological architecture of support to the intrinsic mechanisms that ultimately determine whether engagement is sustainable.

5.3 Internal Drive Limits: Motivation, Self-Efficacy, Self-Regulation as Engagement Constraints

Having examined the multi-layered support system, this discussion now turns inward to interrogate the intrinsic mechanisms that ultimately determine the efficacy of those external supports. Framed as the internal regulatory architecture of student self-support, self-efficacy, motivation and self-regulation constitute the core mechanisms through which external inputs are translated into engagement. While the mediating roles of these factors are well-established in the literature (Han et al., 2021; Huang, 2023; Akram & Li, 2024; Kangwa et al., 2024), the present findings reveal them to be structurally fragile and inconsistently activated. Rather than functioning as efficacious mediators, these internal

bridges often falter, contributing to the central paradox of student self-support. The following discussion probes the specific functioning of these three components within the online College English context.

5.3.1 The Insufficiency of Self-Efficacy

Grounded in Social Cognitive Theory, self-efficacy, defined as individuals' belief in their capability to succeed in designated learning tasks, stands as a core underpinning of student engagement in online learning settings. Self-efficacy is recognised not only as a direct predictor of online engagement but also as a catalyst for shaping other supportive learning factors, which together contribute to improved online learning outcomes (Faro et al., 2025; Li & Xue, 2023; Terro, 2021; Adeshola & Agoyi, 2022; Heo et al., 2021). Despite its well-established significance, the present study identified a notably low level of self-efficacy among participating students, especially regarding self-regulation and task management dimensions.

Quantitative results indicated that self-support constructs, with self-efficacy as a key component, obtained the lowest mean values across all measured variables. This pattern signals a widespread deficit in learner agency, manifesting as lack of learner confidence and perceived competence in managing online learning autonomously, a trend particularly evident in students' self-management capacity and overall learning confidence. Participants commonly expressed insufficient self-assurance in overcoming academic difficulties and tackling learning challenges. Arguably, such low confidence, reflected in weak self-perceived learning support, may be interpreted as a rational reaction to an online environment that fails to provide adequate scaffolding for independent learning.

Qualitative findings (Subtheme 2, Theme 2) further illuminated that students' diminished self-efficacy largely originated from inadequate self-regulation capacity. Unmet learning expectations and unsatisfactory task outcomes tend to undermine learners' self-efficacy beliefs. For instance, one participant commented, *"I can't always complete my homework well"* (S7), while another acknowledged, *"I did not complete some tasks and assignments"* (S8), and a third similarly stated, *"When learning online, I usually do part of my tasks"* (S9). These narratives collectively highlight persistent difficulties in task completion and

self-discipline, which gradually erode self-efficacy over time. Disengagement tends to lower confidence, and reduced confidence subsequently discourages further engagement, thereby forming a negative circular feedback loop. Accordingly, the deficit in self-efficacy observed in this study essentially reflects a fundamental lack of self-regulatory skills, competencies that are indispensable for adapting to the unstructured nature of online learning environments.

Interestingly, by contrast, students reported relatively high levels of technological self-efficacy and expressed confidence in using digital learning tools (Subtheme 2, Theme 1). Most participants demonstrated positive perceptions of educational technologies, and many displayed proficient digital skills, aligning closely with prior research by Maini et al. (2021), Adeshola & Agoyi (2022), Kara (2022), and Li et al. (2023). Positive technological attitudes and readiness to adopt digital tools are widely regarded as vital enablers of online engagement. On its own, technological self-efficacy can indeed motivate active participation. In the present context, however, this heightened technical confidence may have fostered a false sense of preparedness for online learning. As Heo et al. (2021) emphasise, the association between technology usage and actual learning outcomes is far from straightforward. Students may prioritise mastering technical operations over focusing on subject learning itself. When overconfidence in digital tool use coincides with underdeveloped self-regulation abilities, learners are vulnerable to cognitive overload and tend to adopt only superficial, low-depth learning engagement.

Overall, the development of student self-efficacy should not be reduced to merely enhancing general learning confidence. Instead, it requires targeted instructional interventions designed to strengthen learners' self-regulatory capabilities, while guiding students to utilise technological tools in a purposeful, learning-oriented manner that genuinely facilitates academic progress.

5.3.2 The Overpowering Influence of External Instrumental Motivation

The findings indicated that highly autonomous forms of extrinsic motivation, particularly those driven by teacher incentives and aspirations for future employment, emerged as strong predictors of online student engagement within the Chinese cultural context. This

view echoes that of some scholars who hold that extrinsic motivation can also play a positive role when it is internalized and aligned with personal goals (Gao, 2016; Hidi & Harackiewicz, 2010; Yang & Li, 2013). More accurately, extrinsic motivations with different levels of autonomy show relationships with online learning engagement that vary in both strength and direction. Highly autonomous forms of extrinsic motivation, identified regulation and integrated regulation, positively predict online learning engagement, whereas less autonomous forms, external regulation and introjected regulation, exhibit a non-significant promoting effect on online learning engagement (Gao, 2016). In addition, Self-Determination Theory (Deci & Ryan, 2004) posits that extrinsic motivation can gradually internalize into self-determined regulation under supportive conditions, thereby more effectively promoting online learning engagement (Gao, 2016). This challenges the simplistic view that intrinsic motivation is always superior and highlights the importance of real-world relevance in course design (Huett et al., 2008; Rovai et al., 2007; Shroff et al., 2009).

Qualitative data validated this complexity (Subtheme1, Theme2). Instrumental motivation, particularly the pursuit of career advancement, emerged as the dominant engine driving engagement. Teachers exerted a facilitating influence on students' motivation. Extrinsic instrumental motivation can promote students' engagement and learning enthusiasm. The key issue, however, lies in the level of autonomy of such extrinsic motivation. If identified and integrated regulation are high, students' intrinsic motivation is likely to be stimulated. In the Chinese educational context, students' extrinsic motivation is often overly dominant, which may ultimately undermine their sustained learning enthusiasm. Therefore, it is advocated that, under certain conditions, the autonomy of extrinsic motivation can be continuously enhanced and eventually internalized into stable intrinsic motivation, thereby promoting online learning engagement more effectively.

However, this over-reliance on instrumental motivation presents a double-edged sword. On the one hand, it can promote task completion and compliance, especially when reinforced by teacher authority or institutional incentives. On the other hand, it may crowd out the development of intrinsic motivation, particularly when students perceive online learning as a means to an end rather than a valuable experience in itself. The qualitative data support

this concern: while students expressed commitment to their studies, their motivation was often described in transactional terms, with little reference to personal interest or intellectual curiosity. This suggests that without pedagogies fostering autonomy and relevance, extrinsic motivation can dominate and limit meaningful engagement. As Qi et al. (2022) and Akram & Li (2024) note, effective online learning should use extrinsic structures to establish routine, but primarily to cultivate intrinsic motivation through autonomy and relevance.

To address this imbalance, online learning designs should aim to gradually internalize extrinsic motivation by creating conditions that support autonomy, competence and relatedness.

5.3.3 The Unsatisfactory State of Self-Regulated Learning

The current study found that descriptive analysis of cognitive engagement indicators (Online Learning Cognitive Engagement [OLCE] Scale items 3, 5, and 6) revealed mean scores above 3.5, indicating moderate proficiency in basic cognitive strategies. In addition, lower scores were observed for self-regulation and metacognitive management (see Appendix E). For example, only 64.4% agreed that they had set up a learning plan (OLCE8, $M=3.22$), and 69.6% reported conscientiously completing assignments (OLCE7, $M=3.29$), yielding notably lower scores. Although the mean score for goal adjustment (SS8) was slightly higher ($M=3.65$), the overall pattern suggests significant room for improvement.

Qualitative data reinforced these findings (Subtheme 3, Theme 2). Students with strong metacognitive skills demonstrated capacity for detailed planning, time management, task completion and self-assessment, whereas those with underdeveloped metacognition lacked autonomous learning competencies, rarely evaluated progress, and exhibited unstructured learning behaviours. One student noted that they usually completed part of their tasks (S9), reflecting a lack of commitment to sustained self-direction. These disparities highlight a critical issue: much of the prior literature assumes pre-existing metacognitive skills in learners, an expectation more applicable to students at top-tier universities or graduate levels. In contrast, this study examines students from a non-elite Chinese institution, where metacognitive strategies are underdeveloped for many students. Consequently, this

deficiency directly leads to weaker self-regulatory planning abilities, which corresponds with the studies of Wolters & Taylor (2012) Soner (2021) and Tseng & Er. They argued that SRL is fundamentally driven by deep understanding, which in turn is rooted in and constituted by metacognitive awareness and skills. At the core of SRL lies metacognition: the awareness and regulation of one's cognitive process, including metacognitive knowledge and metacognitive regulation (e.g., planning, monitoring and strategy adjustment).

The qualitative data (see 4.8.1) further substantiated that students with strong metacognitive management (like S2/S3) achieved better outcomes despite identical environmental conditions, while those poor in self-discipline (S7/S8) struggled in OSE despite available supports. In unsupervised online contexts, metacognition becomes particularly critical for sustaining focus and evaluating progress (Meece et al., 1988; Zhang, 2012). Positive performance serves as a crucial safeguard for the successful completion of tasks; non-achievement (above mentioned), on the other hand, has a negative impact on task completion. Commitment, meanwhile, acts as a vital motivator that drives task completion forward. Consequently, students should strive for positive performance, avoid non-achievement and uphold their commitments steadfastly. Thus, students who exhibit strong self-regulated learning competencies, such as self-discipline, task completion, effort, and learning planning, are more likely to use metacognitive learning strategies and to achieve higher levels of online learning engagement. The weak self-regulated learning abilities observed in students in this study (This echoes the point made in section 5.1.1) suggest a lack of guidance in metacognitive learning strategies within the instructional design of College English courses. This reinforces the idea that self-regulation acts as a mediator between environmental resources and learning success.

5.3.4 Key Highlights of Student Self- Support

The findings expose the fragility of self-support, furthermore, from prior research converge to reveal a critical synergistic mechanism for online learning success, where motivation, self-regulation and self-efficacy interact multiplicatively rather than operating in isolation. This ideal is evidenced across contexts: Yundayani et al. (2025) demonstrated that the synergy of confidence, satisfaction and attention was paramount; Karman et al. (2023)

showed the interplay of engagement, self-regulation and creative self-efficacy enhanced wellbeing; and Briones et al. (2023) confirmed that balanced levels of engagement, SRL, and self-efficacy defined the learning experience. Together, they present a model where these three pillars are mutually reinforcing.

In contrast, the findings of the present study indicate a breakdown in this synergistic chain. Specifically, self-efficacy and motivation failed to translate effectively into metacognitive self-regulation, resulting in the lowest level of cognitive engagement. This suggests that while the literature posits an ideal, dynamic system, the reality for the participants in this context was a deficiency in the crucial metacognitive and self-regulatory skills needed to bridge motivation and efficacy into sustained, deep engagement.

Therefore, the central task is to address the observed gap systematically. This requires online educational interventions to be explicitly integrative. Simply assuming that motivation and efficacy will spontaneously give rise to self-regulation is insufficient. Instead, instructional design must proactively and concurrently develop these three interdependent pillars. Ultimately, the goal is to foster learning environments where students can build confidence (efficacy), recognize value (motivation), and be explicitly taught how to exercise metacognitive control (self-regulation). Only through such a concerted effort can the theoretical synergy be translated into a sustainable learning reality.

5.4 Summary of the Discussion

The discussion reveals a distinct hierarchical pattern in the predictors of online engagement. It articulates that OSE is less about intellectual curiosity and more about managing academic survival. While external supports are positively associated with engagement overall, student self-support emerges as the strongest direct predictor, whereas teacher and peer support do not show significant effects in the multivariate model. This suggests that external factors may primarily function by enabling an internal regulatory core, reflecting an ecological shift of influence from outer systems toward the individual level.

Notably, the findings highlight the unique contributions of institutional support and family support, both of which remained significant in the overall regression model, unlike teacher

and peer support. This is particularly meaningful because institutional and family supports are often treated as distal or background conditions in online learning research. Our data indicate that during crisis-driven online education institutional reliability and family stability become proximal enablers of engagement, actively shaping students' capacity to participate and persist.

This also highlights the unique characteristics of support systems in the context of the pandemic. Meanwhile, Qualitative findings outline the intrinsic chain of "self-efficacy → motivation → self-regulation", yet integrated data reveal a disruption at the "motivation → metacognitive self-regulation" link. This rupture explains the paradoxical prevalence of moderate behavioural engagement coexisting with deficient cognitive engagement, underscoring that without robust self-regulatory translation, even strong motivational drivers fail to yield deep learning outcomes.

5.5 Theoretical Explorations in Understanding Online Student Engagement in Crisis Contexts

The preceding discussion synthesizes the core findings, assessing their academic value, practical implications, and instructional relevance. Theoretically, it reveals a functional reconfiguration within the online learning ecosystem: interpersonal interaction at the mesosystem level is compressed, while microsystem factors, particularly self-support, become dominant. Qualitatively, intrinsic mechanisms explain why mesosystem supports (e.g., teacher / peer support) fail to enhance self-efficacy and motivation due to diminished presence and interaction delays, placing greater reliance on self-regulation. Building on this, the following section examines how the study challenges, refines and extends existing theories in crisis-driven online education.

5.5.1 Extending Social Cognitive Theory through Crisis-informed Insights

The findings underscore the structural fragility of self-support under sudden crisis conditions, thereby exposing the limitations of Bandura's triadic reciprocal determinism in accounting for large-scale systemic disruption. Specifically, the data suggest that personal agency has a breaking point when environmental and behavioural factors become

unfavourable.

Bandura's triadic model proposes a dynamic cycle between Personal (P), Behavioural (B), and Environmental (E) factors. Student self-support (e.g., self-efficacy, motivation) represents the P factor; online engagement is B; and teacher, peer, and institutional supports constitute E. A key finding is the relatively low level of student self-support (P; $M=3.72$), which is not merely a result but a critical explanatory variable. This weakness likely triggers a negative feedback loop: low self-efficacy and motivation (P) reduce engaged learning behaviours (B), which in turn limits students' ability to perceive or utilise environmental supports (E). Consequently, the E factors fail to reinforce confidence and skills, further weakening P. This cyclical view reframes the "effect" of environmental supports, and their efficacy is mediated by students' personal agency. For example, even strong teacher support (E) may prove ineffective if a student's low self-efficacy (P) prevents them from acting on it (B).

A core theoretical contribution of this study is the identification of a structural discontinuity within Bandura's triadic reciprocal model. The findings reveal a disconnection within the chain of internal cognitive processes. This outcome extends the triadic reciprocal model of Social Cognitive Theory, suggesting that in online learning contexts, the "person-behaviour-environment" interaction may follow an alternative pathway: when interpersonal environmental support (teacher and peer support) weakens, self-regulation within the individual becomes the critical mediator linking motivation to behavioural engagement, with weak metacognitive strategies representing the point of fracture in this chain.

5.5.2 Revising Educational Ecological Theory Through a Crisis Lens

The data reveal that the COVID-19 pandemic, operating as a macrosystemic shock, did not merely disrupt the educational environment but fundamentally overwhelmed and reconfigure its ecological architecture. This challenged the assumptions of traditional ecological models, which often presume relative environmental stability, particularly the function of microsystem (eg. teacher and peers). This finding revises the classic ecosystem theory's assumption of the "central role of microsystems", (in our study they are classified

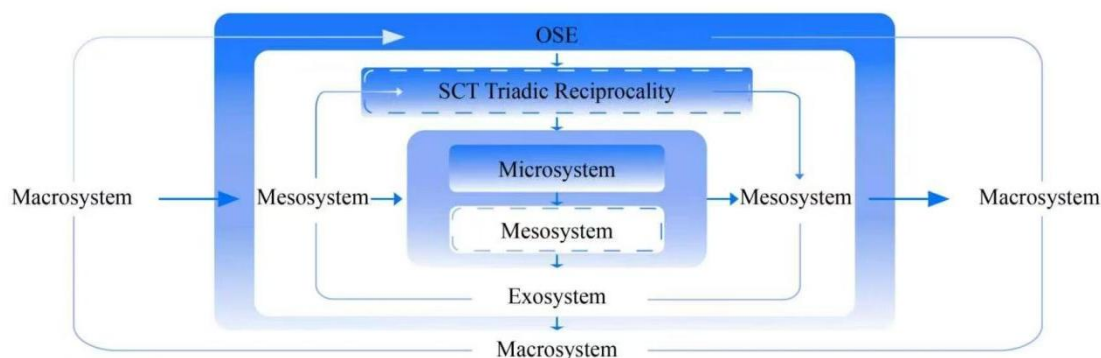
in mesosystem) revealing the reconfigured weight of different ecological levels in the online context.

The sudden and system-wide nature of the pandemic forced a rapid transition to unfamiliar digital learning environments. In this new environment, the traditional supportive pathways that typically develop in physical classrooms, such as a teacher's encouraging glance or spontaneous peer discussions, were severed. These mesosystem connections (in traditional ecological model, they belong to the microsystem) that naturally form in a physical classroom failed to seamlessly transfer to the online space. As a result, teacher and peer support were often perceived as more transactional (focused on technical help or answering direct questions) than as integrated, relational resources that could fundamentally nurture students' intrinsic motivation and self-regulation.

From an ecological perspective, the central challenge is not merely the absence of support, but the breakdown of the pathways through which such support can be internalized by the student-self. Restoring balance requires consciously engineering these connections within the digital learning ecosystem.

5.6 An Integrated Theoretical Framework for Online Student Engagement in College English Teaching

Based on its findings, discussions, theoretical refinements, this study proposes a comprehensive theoretical framework and constructs, optimizes, and theoretically integrates an ecosystem for online English learning engagement, thereby outlining pathways for both crisis response and long-term development among College English students.



Graph 5-1 An Integrated Theoretical Framework for Online Student Engagement in College English Teaching

5.6.1 Interpretations of the Integrated Theoretical Framework

This section comprehensively interprets the proposed integrated theoretical framework for college students' online English learning engagement in crisis contexts by elaborating its theoretical foundations, structural architecture and operational mechanisms.

1) Core Theoretical Underpinnings

The proposed framework draws on three established theoretical perspectives to explain online engagement in crisis contexts. Ecological Systems Theory structures the nested environmental layers (micro-, meso-, exo-, and macro-systems) that bidirectionally shape learning contexts. Social Cognitive Theory offers a dynamic mechanism that drive engagement within this structure, positing a triadic reciprocity among personal factors, behaviour and environment. Constructivism defines the core of learning engagement as active process of meaning construction, whereby students build knowledge, experience and values through interaction.

These perspectives are treated here as conceptually complementary rather than simply additive. The triadic reciprocity of Social Cognitive Theory and the meaning construction of Constructivism reinforce one another: interactions among person, behaviour and environment promote meaning-making, while the outcomes of such construction in turn reshape personal, behavioural and environmental factors, creating a dynamic cycle. Within the ecological structure, Bandura's triadic reciprocal determinism establishes cross-level

dynamic interactions, and constructivism provides the foundational premise of active student-led knowledge building. Together, these integrated perspectives yield a coherent model characterized as "ecological levels + cognitive interaction + active construction", which systematically explains the mechanisms influencing Chinese College English students' online learning engagement during crises.

2) Multi-Layered System Structure: A Nested Hierarchy

Consistent with the layered structure of ecological systems, the framework is organized from the most immediate settings to broader contextual influences.

It begins with the Microsystem, representing the immediate context of interaction centred on the student self, where knowledge and identity are actively developed.

Moving outward, the Mesosystem comprises the linkage to microsystems, involving elements like the online teaching platform, teachers and peers. Here, bidirectional interactions occur, for example, teaching styles affect student engagement, while student participation prompts instructional adjustments, peer collaboration enhances learning, and platform resources enable richer, more interactive activities.

Next, the Exosystem constitutes the resource and policy layer that indirectly influences students. It includes the university, with its online teaching management policies, and the family, which provides support or potential interference.

Finally, the Macrosystem forms the overarching context, shaped by broader cultural, technological and policy environments. Components like the COVID-19 pandemic and China's technological and educational landscape exert bidirectional influence across all inner systems, while also being continually shaped by changes within them.

3) Bidirectional Construction and Dynamic Loop

A defining feature of this framework is the systemic bidirectionality of influence across ecological layers. This is not a static hierarchy but a dynamic, closed-loop system.

From a bottom-up perspective, advancements in macro-level technology drive the optimization of exosystemic resources (university platforms), thereby facilitating more efficient platform implementation and usage within the mesosystem, strengthening microsystemic self-support, and ultimately culminating in heightened student engagement.

Conversely, adopting a top-down perspective, heightened student engagement reinforces self-efficacy and self-regulatory capacities within the microsystem, intensifies collaborative dynamics in the mesosystem, propels the iteration of policies and resources at the exosystem level, and ultimately drives the continuous optimization of the macro-environment.

This framework elucidates the systemic bidirectionality of influence, mapping both top-down and bottom-up pathways across ecological strata. Crucially, it foregrounds student agency as the generative force in meaning-making and adaptive regulation amid structural tensions. Within this model, the pandemic functions not merely as a disruptive environmental variable but as a critical contextual lever that triggers cognitive restructuring and behavioural reshaping, thereby compelling a paradigmatic shift in engagement from passive adaptation to active creation.

5.6.2 Features and Contribution of the Integrated Theoretical Framework

This theoretical framework redefines Online Student Engagement (OSE) as the dynamic process in which learners actively construct meaning, through knowledge building, experience acquisition and self-regulated skill development, by navigating multi-layered interactions across micro-, meso-, exo- and macro-systems, mediated by the triadic reciprocity of social cognition.

Within the visual representation, it is worthy of note that the section on social cognitive theory is enclosed in a dashed-line box, symbolizing the diminished predictive capacity of direct interpersonal interaction in online settings (see 5.5.1). Correspondingly, the mesosystem in the ecosystem model is also rendered as a dashed line, which indicates its diminished role and clarifies that the weight of the online contextual layer is subject to change (see 5.5.2). This demonstrates that shifts in external hierarchical weights, combined

with disruptions in internal mechanism chains, constitute phenomena that existing theories have not yet adequately integrated into the characterization of engagement mechanisms in online learning contexts.

The abrupt shift to Emergency Remote Teaching (ERT) functioned as a macrosystem disruption, destabilized the entire educational ecology. College English education was forced into a rapid and uneven adaptation. The exosystem, institutional policies, resources, and administration responded in haste, leading to systemic misalignment across infrastructure, pedagogy and support. In this crisis mode, traditional engagement supports like routines, peer interaction, and in-person teaching were removed, weakening the mesosystem. The focus was narrowed to content delivery and basic behavioural participation, leaving little room to foster the deeper meso-level interactions needed for student-driven learning. The ecosystem became survival-oriented, losing the synergy required for sustainable educational development.

The primary contribution of this framework lies in three aspects: First, it adds the boundary condition of "shifting weights of ecological levels in online contexts" to ecosystem theory. Second, it clarifies for social cognitive theory the "alternative triadic pathway under weakened interpersonal interaction". Third, it provides a theoretical basis for intervention targets in online College English teaching (presented in chapter 6), shifting the focus from enhancing teacher/peer support to empowering students' self-regulation, particularly the development of metacognitive strategies.

Furthermore, this framework illustrates that OSE within a micro-educational ecosystem depends on the interaction and balance across all ecological layers. When these layers function in harmony, OSE flourishes not as a passive outcome but as an active, sustainable negotiation: students are empowered to direct their own learning because the surrounding ecosystem supports their needs. Conversely, ecological misalignment arises when systems operate at cross-purposes, placing disproportionate burden on students to reconcile conflicting demands.

In all, this chapter interprets and discusses the findings, highlights the systemic imbalances brought about by the pandemic, and constructs a theoretical integrated framework of online

student engagement. It argues that the ultimate quality of student online engagement is determined by the degree of alignment or misalignment between multi-level ecological supports and students' intrinsic mechanisms, with their dynamic interplay serving as the mediating force.

Chapter 6 Conclusions

This thesis investigates the complex dynamics of College English online teaching during the COVID-19 pandemic. It aims to identify the systemic factors shaping student engagement by examining how macro-level disruptions reconfigured the teaching ecology, exploring the interplay between student self-support (e.g., motivation, self-efficacy) and proximal supports (e.g., teachers, peers), and assessing the role of distal supports (e.g., institutional and family structures). Employing a mixed-methods approach, the study challenges predominant models that either prioritize teacher support or view engagement merely as a function of individual effort. Instead, it advocates for an ecological framework, positing that engagement is an emergent outcome of the alignment, or misalignment, between a student's internal capacities and a coherent system of external resources. Building on this synthesis, the present chapter elaborates on the broader significance of these insights.

6.1 A Dynamic Ecological Model: A Systematic Response to the Research Questions

This study centres on the following research questions:

1) Research Question 1: What are the perceptions and experiences of Chinese College English students regarding their online engagement across behavioural, cognitive, affective and interactive dimensions during the pandemic? How do the levels of engagement in these dimensions differ according to students' gender, academic major and year of study?

To address Research Question 1, this study systematically examined the structure and characteristics of College English student online engagement. Using survey data, it identified four core engagement dimensions—behavioural, cognitive, affective and interactive—providing a clear conceptual framework for analysis. Descriptive statistics outlined engagement levels across these dimensions, while difference analyses (t-tests, ANOVA) revealed how gender, major, and year of study significantly influenced engagement. Together, these findings offer a comprehensive response to the question of

how online engagement is structured and what factors shape it. Full analysis is detailed in Chapter 4, Sections 4.2.5 (summary) and 4.4.4. (summary)

2) Research Question 2: What is the relationship between multi-layered support factors (self-support, teacher, peer, institutional, and family support) and online student engagement? To what extent does each support factor uniquely predict the different dimensions of engagement?

In response Research Question 2, this study conducted a correlational analysis to identify the relationships between the four dimensions of engagement and their influencing support factors. Subsequently, multiple linear regression analysis was employed to quantify the unique contribution of each support factor to each individual engagement dimension, as well as to overall student engagement. This two-step analytical approach not only reveals the extent to which the support factors are associated with different facets of engagement, but also clarifies the independent predictive strength of each factor when considered simultaneously. The results delineate a clearer picture of how different supports such as teacher guidance, peer interaction, and institutional affordances differentially contribute to behavioural, cognitive, emotional, and interactive engagement, and collectively shape the overall engagement construct. Detailed results of these analyses are reported in Chapter 4, specific sections: Sections 4.5.3 and 4.6.8.

3) Research Question 3: What intrinsic mechanisms underpin Chinese College English online student engagement, and how can understanding these mechanisms inform strategies for sustainable development in online teaching?

To address Research Question 3, this study employed a mixed-methods design, integrating quantitative data with in-depth qualitative insights gathered through semi-structured interviews with both students and instructors. Using thematic analysis, the research identified and verified the internal mechanisms that drive or hinder online student engagement. Furthermore, it examined how these internal processes, such as self-regulation, motivation, and metacognition, interact with external influencing factors, including instructional design, technological support, and social context. The analysis also pinpointed specific points of breakdown within these mechanisms and elucidated the

underlying causes. Based on these findings, targeted intervention strategies were proposed to strengthen engagement pathways and address identified gaps. Detailed qualitative analysis and thematic findings are presented in Chapter 4, Section II: Qualitative Research, specifically, Theme 2, Theme3 and 4.8.1., while corresponding interventions and recommendations are outlined in Chapter 6, Section 6.5.

6.2 Summary of Key Findings

This study used a mixed-methods approach to examine how Chinese college students engaged with online English instruction during the COVID-19 pandemic. It addressed three research questions focusing on the level and characteristics of engagement, the relationships between engagement dimensions and influencing factors, and the intrinsic mechanisms of engagement. The findings highlight the systemic nature of online engagement.

6.2.1 The Level and Characteristics of Engagement

Student engagement in online College English courses is not a fixed individual trait, but a systemic outcome emerging from the dynamic interplay of personal, instructional, and contextual factors. The overall level of engagement among students during the COVID-19 period was moderate, with notable variation across dimensions. Engagement patterns were predominantly reactive and teacher-dependent, highlighting a significant challenge in student self-regulation.

A key finding is the fragility of students' self-support capacity. Interview data revealed that a widespread lack of self-discipline and ineffective learning management strategies directly undermined task completion and eroded self-efficacy. While Interactive Engagement was relatively highest, driven largely by teacher-led synchronous activities, students showed limited initiative in asynchronous communication. Cognitive Engagement was the weakest dimension, with particular deficits in metacognitive strategies like goal-setting and planning for English learning. Behavioural Engagement was primarily confined to in-class compliance rather than extending to independent learning activities. Affective Engagement showed an intermediate but dispersed level. Consistent with the

four-dimensional analysis, the examination of influencing factors reveals a dependent engagement pattern with the lowest mean of student self-support. Demographic analyses indicated minor variations by gender and academic specialty in interactive and affective engagement, with no significant differences across years of study.

6.2.2 The Relationships Between Engagement Dimensions and Their Influencing Factors

The analysis revealed a complex relationship between supporting factors and four engagement dimensions. Correlation Analysis showed all five support factors, student self-support (SS), peer support (PS), teacher support (TS), institutional support (IS) and family support (FS), positively correlated with all online learning engagement dimensions ($r = 0.5-0.9$), with Self-Support (SS) demonstrating the strongest relationships. Multiple Regression Analysis provided more nuanced insights into unique contributions:

Student Self-Support (SS) had the strongest impact, significantly predicting all four engagement dimensions ($p < 0.01$). Peer Support (PS) and Teacher Support (TS) both significantly predicted online learning behavioural engagement (OLBE), though TS had a weaker effect and, despite high perceptions in interviews, showed limited unique predictive power in regression. Institutional Support (IS) significantly predicted interactive, affective, and behavioural engagement. Family Support (FS) significantly predicted cognitive, affective, and behavioural engagement.

For overall engagement, SS, IS, and FS were significant predictors, while TS and PS were not. The limited unique predictive power of certain factors, particularly TS, despite high correlations suggests overlapping effects and a potential mediating role of SS.

6.2.3 Intrinsic Mechanisms of Engagement

Thematic analysis of interviews, together with relevant quantitative data, indicated that the intrinsic mechanisms of student engagement lie in students' motivation, self-efficacy and self-regulation. This aligns with the role of student self-support. When students' intrinsic mechanisms for online learning engagement receives appropriately matched support within the ecosystem, it becomes activated and drives an increase in their online learning

engagement. Yet a central paradox emerged: while self-support is the most powerful predictor of engagement, it is also the most fragile. Many students begin online College English classes lacking the metacognitive strategies and emotional strength needed to manage their own learning, particularly during times of disruption. This fragility, coupled with inconsistent alignment among other support systems, limits the full realization of engagement.

In conclusion, this study demonstrates that online student engagement is a systemic and dynamic outcome, fundamentally dependent on the quality and coherence of support across multiple levels. Student self-support acts as the core engine, yet it remains the weakest link. These findings challenge reductionist views of engagement as a mere function of student effort, advocating instead for an ecological and aligned support framework that proactively strengthens internal student capacities while strategically coordinating all external resources.

6.3 Contributions

This study makes theoretical, empirical, and practical contributions to the field of online student engagement, particularly in the context of EFL (English as a Foreign Language) education in China.

6.3.1 Theoretical Contributions

This study develops an integrated framework of College English online teaching by extending and refining existing theoretical frameworks to more accurately capture the complexity of online student engagement in crisis-driven educational contexts. Specifically, it reveals a hierarchical structural relationship among the four dimensions of engagement, providing empirical grounding for the theoretical conceptualization of this structure.

Building on this, the study further clarifies the applicability boundaries of Bronfenbrenner's Ecological Systems Theory and Social Cognitive Theory within the specific context of online College English teaching:

1) Reconstructing Ecological System Weights

The findings indicate a significant shift in the hierarchical influence of ecological factors on student engagement from external to internal, and from interpersonal interaction to self-oriented processes. In particular, the role of the mesosystem (teacher and peer support) is surpassed by that of the exosystem (family and institutional support) and individual internal factors (self-regulation).

2) Revising the Microsystem Assumption

This discovery challenges the classical ecological systems theory's premise that the microsystem (traditionally referring to teachers and peers) plays a central role. In the present study, teachers and peers are reconceptualized as components of the mesosystem. In this study, the roles of teachers and peers operate at the mesosystem level. Their influence indirectly shapes students' developmental context through disconnections or conflicts with microsystems (student self).

3) Supplementing the Boundary Conditions of Social Cognitive Theory

The study identifies a mechanism chain of self-efficacy → motivation → self-regulation, and pinpoints breakdowns at the metacognitive level as the primary cause of low cognitive engagement. This provides an important boundary condition for applying social cognitive theory in online learning environments, namely the constraint imposed by weakened interpersonal interaction.

6.3.2 Empirical Contributions

Based on data collected from Chinese College students during the COVID-19 pandemic, this study offers several significant empirical contributions to the understanding of online student engagement in College English learning.

It first provides new evidence regarding the factors influencing online learning engagement in the context of College English Teaching. The findings indicates that self-support is the strongest predictor of student online engagement ($\beta = 0.593$, $p < 0.001$), while teacher

support and peer support shows no predictive power on online student engagement. It challenges the common assumption that teacher support is the most critical factor in OSE (Faro et al., 2025; Huang and Wang, 2023; Li & Xue, 2023; Tauchid, 2025; Huang, 2023; Robinson, Jr., 2025), thereby prompting a re-evaluation of dominant support paradigms in online learning environments.

The study then goes beyond surface-level correlations to uncover the underlying mechanisms of online student engagement. By identifying motivation, self-efficacy and self-regulation as key mediators, it sheds light on how internal capacities interact with external conditions to drive or hinder engagement. These insights deepen the theoretical and empirical understanding of engagement as a psychologically grounded process, not merely a behavioural outcome.

In the third place, through a detailed analysis of the four engagement dimensions (behavioural, cognitive, affective and interactive), the research identifies a lack of metacognitive learning strategies. This points to generally weak self-regulatory abilities among students. The results offer targeted practical implications for instructional design, suggesting that fostering metacognitive awareness should be a priority in online College English courses.

Together, the contributions advance empirical knowledge by revealing both the dominant role of internal capacities and the limitations of relying solely on external support structures. They show the factors that sustains or weaken engagement in online learning environments.

6.3.3 Practical Contributions

Based on the dual findings of hierarchical weight restructuring and mechanism chain breakdown, this study proposes two major shifts in intervention targets:

First, a shift from strengthening teacher and peer support to empowering students' self-regulation, with a particular focus on cultivating metacognitive strategies.

Second, a shift from single-level intervention to cross-hierarchical coordination,

integrating teacher, peer support, family, school support (mesosystem) and self-support (individual internal factors) to fill the support gap caused by weakened interpersonal interaction in the microsystem.

6.4 Implications

The study holds significant implications for various stakeholders in online education, especially in the context of College English Teaching.

6.4.1 For Instructional Design

This study identifies a critical empirical gap in current understandings of online engagement, highlighting the need for further research to improve both the theory and the practical instructional design of College English online courses. Course design must intentionally embed scaffolds to build student self-support, not just deliver content. The implication is that online education must do more to explicitly teach and support the development of metacognitive and self-regulatory skills, rather than assuming students already have them. Instructional quality (design, feedback, interactivity) is as important as interpersonal encouragement. Simply enabling peer interaction is insufficient; collaborative tasks need careful scaffolding and support.

6.4.2 For Instructors

The findings carry important messages for instructors teaching in online College English courses. The instructor's role must expand from "sage on the stage" to a coach and facilitator of self-support. This requires proactive strategies to build student confidence and motivation through personalized feedback and encouragement. Faculty need professional development on how to recognize signs of low self-efficacy and poor self-regulation learning (SRL), and intervene with supportive strategies rather than just academic corrections. In this light, instructors become a steady presence who helps students believe in their potential, develop their learning strategies and take ownership of their growth.

6.4.3 For Institutional Policy

Institutions should implement mandatory orientation modules that specifically focus on building students' readiness for online learning. By teaching metacognitive and self-regulated learning (SRL) skills before students begin their credit-bearing courses, teachers can assist them in feeling more prepared and confident in online environments. Meanwhile, student support services (e.g., tutoring, counselling) need to be tailored to address the psychological and metacognitive challenges of online learning, rather than merely academic deficiencies.

6.5 Recommendations

This study argues that enhancing online student engagement in College English requires integrating fragmented teaching support systems to achieve ecological coherence, where all elements of the learning environment mutually reinforce one another. Having clarified the key drivers of such engagement, and in direct response to Research Question 3, this study proposes practical measures aligned with ecological balance and sustainable development in College English online teaching.

6.5.1 Prioritizing the Development of Student Self-Support Capacities

The research identifies student self-support, including motivation, self-efficacy and self-regulation, as the engine of student engagement. Many students enter online College English courses with insufficient strategies to manage their own learning, which is a problem magnified during periods of disruption.

1) Three Key Strategies to Implement

To develop the capacity for self-support, this study proposes three key strategies to implement.

First, instructors integrate self-regulated learning modules into course design, guiding students in goal-setting, progress monitoring and strategy selection.

Second, instructors implement targeted metacognitive coaching, guiding learners in planning complex reading tasks, tracking vocabulary acquisition and evaluating writing

performance.

Thirdly, instructors foster scaffolded autonomy by gradually releasing responsibility, allowing students to make decisions about pacing, format and assessment while remaining within a safe, responsive structure. Teachers, too, need professional development to recognize early signs of fragile self-support, such as withdrawal, repeated delays or minimal self-correction, and to respond with personalized encouragement and concrete scaffolds.

2) Actionable Ideas in Practice

To promote students' progress, instructors should formulate actionable ideas in practice.

First, goal setting and planning must be institutionalised. Instructors should start each unit or week with a 5-minute activity where students set a specific, measurable language goal (e.g., *"I will learn and use 10 academic adjectives in my forum post this week"*), thereby shifting from passive attendance to proactive intentionality.

Second, explicit strategy instruction is essential. Rather than merely assigning tasks, teachers should demonstrate cognitive processes via think-alouds (e.g., inferring meaning from context during reading) and provide evaluative checklists that sequence priorities (e.g., prioritizing organizational coherence over grammatical accuracy in writing self-editing).

Third, progress tracking should be employed. Instructors design simple and integrated trackers. Students could maintain a personal "Vocabulary Dashboard" or complete a brief weekly reflection journal answering: What was my most effective study session for English this week? What will I do differently next time?

When students are equipped with the tools to manage their own learning, they become not only more engaged, but also more resilient, confident and capable of thriving both in and beyond the online classroom.

6.5.2 Redefining Teacher and Peer Support Roles

Teacher and peer support should be strategically leveraged not only for knowledge transmission or social encouragement, but as scaffolds for cultivating students' self-support competencies. The ultimate aim is to use this external support to nurture internal self-regulation, so that learners rely progressively less on teachers or peers over time.

1) Reorientation of Teacher Roles from Answer-Giver to Learning-Process Coach

To shift the teacher's role effectively, institutions should support faculty in developing dual competency, combining the ability to build authentic interpersonal connections with the skill to design cognitively meaningful activities for both synchronous and asynchronous learning environments. This shift can be implemented through the following structured practices.

First, establishing predictable interaction routines is fundamental. By implementing consistent, low-stakes touchpoints, such as weekly check-ins, timely formative feedback cycles, and clear windows for instructor response, we can reduce student anxiety, foster trust, and create a reliable learning structure.

Second, embedding metacognitive guidance within feedback redirects the focus from mere correction to cognitive visibility. Prompts such as "What strategy did you use to outline this essay?", "How effectively did it serve your purpose?" encourage learners to reflect on their decision - making process rather than fixating on the final outcome.

Third, reframing support spaces as strategy consultations transforms traditional office hours. By centring discussions on how students plan and monitor their assignments rather than solely clarifying content, instructors model the processes of self-regulated learning (SRL).

Together, these steps help transition the instructor from a source of answers to a facilitator of self-regulated learning, equipping students with the skills and confidence to direct their own academic growth.

2) Redesigning Peer Support for Equity and Depth

Peer interaction in online English courses often alleviates isolation, yet it seldom fulfils its potential for cognitive growth. Participation tends to be uneven: higher-proficiency students dominate, while others remain passive. This imbalance limits peer support to a social function, preventing it from becoming a powerful driver of learning for all. To make peer support a true learning catalyst, College English programs should

(1) design mixed-ability small groups that bring together students with different proficiency levels, learning styles, and communication preferences. Clear roles and accountability measures should be established to ensure that everyone contributes meaningfully.

(2) enable multiple modes of contribution, such as text, voice, video and collaborative documents, so that students can engage in ways that align with their comfort levels and strengths. Not everyone learns or expresses themselves in the same way, and offering choices encourages fuller involvement.

(3) teach students collaborative skills and inclusive dialogue techniques, focusing on listening attentively, paraphrasing others' points, and building on ideas together, rather than just rushing to complete tasks. These skills help create a culture where every voice is valuable.

When these measures are in place, peer support evolves from a social courtesy into a substantive academic resource. It becomes a space where students feel not only accompanied, but also grow together, through language, thought, and mutual exchange.

6.5.3 Integrating Institutional and Family Supports for Engagement

While the reconfiguration of teacher and peer roles addresses immediate instructional dynamics, a comprehensive ecological intervention requires a parallel transformation at the institutional and familial levels.

In the first place, the study advocates the reframing of institutional roles from logistics to learning-centricity. Institutions must redesign curricula and digital infrastructures to prioritize personalized learning pathways and self-directed inquiry. In addition, to

transcend the limitations of one-size-fits-all teaching models, institutions deliver targeted scaffolding, including metacognitive training and psychosocial counselling and individualised feedback. This is especially critical in online settings, where learners rely more heavily on autonomy and self-management.

In the second place, it proposes activating family support as a stabilizing system. Families are a key external support structure, especially during challenging transitions. Rather than viewing them as passive observers, institutions should actively engage them as partners in the learning process. This can be done by (1) providing clear, consistent and empathetic information to families to align expectations, ease anxieties, and to help them support students' academic and emotional needs; (2) ensuring that families can help students access reliable internet, quiet study space, and mental health services, foundational needs for sustained engagement; (3) recognizing families as active agents in engagement. When informed and included, they can reinforce motivation and extend the support provided by the institution.

Together, these layers of support, institutional flexibility and proactive family partnership, create a stable, responsive ecosystem that helps students engage more deeply and persistently, particularly in demanding subjects like College English.

Ultimately, engaging students online depends on carefully scaffolding their own agency, fostering meaningful teacher-student and peer relationships, and ensuring robust institutional and family support. When pedagogy, technology and human connections align into one coherent ecosystem rather than pulling apart, online language learning can move from merely functional to genuinely transformative.

6.6 Limitations

Despite the contributions, this study is subject to several limitations: First, the sampling and contextual specificity, drawing primarily from a single second-tier university during the COVID-19 pandemic, restricts its applicability to other institutional levels and non-crisis periods. This is because unique stressors, such as social isolation and an abrupt transition, likely influenced engagement patterns. Second, the reliance on a cross-sectional

design limits causal inference; although it identifies a metacognitive "breakage" and confirms construct reliability (e.g., cognitive commitment), it cannot empirically demonstrate how to repair this break or capture long-term trends, necessitating future longitudinal or time-series studies. Third, the study identifies a shift in ecological weights but lacks analysis of specific boundary conditions (e.g., small classes, synchronous interaction) where teacher/peer support might retain dominance. Fourth, the model overlooks critical mediators such as course content design, technical platform usability, and specific learning resources, potentially introducing omitted variable bias.

6.7 Directions for Future Research

To gain deeper insights into online engagement, researchers must pursue a diversified investigative strategy. Building on this study's revelation of the dual restructuring (ecological weight shift and metacognitive breakage), scholars must first explore the boundary conditions of these shifts, specifically, identifying the instructional contexts (e.g., small classes, synchronous interaction) where teacher/peer support may retain its centrality. Second, research must move beyond static analysis to employ longitudinal designs that capture how engagement evolves over time and under prolonged digital exposure, while also utilizing cross-cultural comparisons to account for varying institutional and cultural norms. Third, to repair the identified mechanism chain breakage, intervention-based studies are needed to test how targeted metacognitive training can restore the conversion pathway from self-efficacy and motivation to self-regulation and cognitive engagement. Finally, investigations into learner heterogeneity (gender, Year, major, learning styles) and the moderating roles of emerging technologies (AI-driven analytics, adaptive systems) will provide a more comprehensive, dynamic, and forward-looking perspective on how diverse students navigate online ecosystems.

6.8 Final Reflections

This study proposes an integrated theoretical framework for pandemic-era online College English Teaching in China, which integrates four dimensions of student engagement and five support factors. Situated within the ecosystem theory, the framework is used to

explore inter-factor and cross-level interactions, identify systemic imbalances and suggest interventions. Far from being determined by any single factor, engagement has been shown to emerge from the interplay between learners' internal capacities, such as self-efficacy, motivation and self-regulation, and external supports provided by teachers, peers, institutions and families. Therefore, to keep the College English online teaching ecosystem balanced, it is essential to put in place and align supportive systems at every level so that students, teachers, and institutions can all thrive in this digital learning environment.

By integrating theory, method and empirical context, this research advances a more holistic, actionable and ecologically grounded understanding of how students engage in online learning environments. As online learning continues to evolve, the insights gained from this study point to a shared responsibility among educators, institutions and policymakers to create learning ecosystems that are not only flexible and accessible, but also engaging, inclusive and responsive to the diverse needs of learners in an ever-changing world.

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Appendices

Appendix A: The Formal Survey Questionnaire

Dear fellow students,

I am currently a doctoral candidate conducting research on "College English Online Teaching During the Pandemic in China: A Perspective on Students' Learning Engagement". To gather valid data and improve the efficiency of online teaching, I have compiled two questionnaires. I kindly request that you express your feelings truthfully. Thank you sincerely for your support and cooperation.

You are being invited to participate in a questionnaire as part of a research study. Before deciding to participate, it is essential that you understand the purpose of the study, what your involvement will entail, and any potential risks or benefits. Please read this consent form carefully and take the time to ask any questions that you may have before deciding to participate.

The purpose of this study is to explore the situation of College English Online Teaching under the epidemic. The information collected from this questionnaire will be used to analyse the student engagement in the online English classes.

If you agree to participate, you will be asked to complete the questionnaire provided. Your participation is entirely voluntary, and you may choose not to answer any question(s) that you do not wish to.

All the information collected from this questionnaire will be kept strictly confidential. Your responses will be anonymised and reported in aggregate form, which means no personally identifiable information will be disclosed in any publications or reports. Only the research team will have access to the data. Please note that there may be exceptions to confidentiality if required by law or as necessary to protect participants or others from immediate harm.

There are minimal risks associated with participating in this questionnaire. While every precaution will be taken to protect your data, the potential risks of a breach of confidentiality cannot be entirely eliminated. However, we have implemented appropriate safeguards to protect your information.

Please if you agree to the following statement, please tick the following boxes.

☐ I confirm that I have read and understood the introduction of the questionnaire. I have had an opportunity to consider the information and what will be expected of me. I have also had the opportunity to ask questions which have been answered to my satisfaction.

☐ I hereby confirm that I understand the inclusion criteria as detailed in the questionnaire and explained by the researcher.

☐ I voluntarily agree to take part in this study.

Questionnaire 1: This includes a general information questionnaire and a survey scale on students' learning engagement in College English Online Teaching during the epidemic.

Questionnaire 2: Factors Influencing students' learning engagement in College English Online Teaching during the epidemic.

The questionnaires consist of 66 questions and take approximately 9 minutes to complete. It is completely anonymous, and there are no right or wrong answers. The data collected will be solely used for research purposes and will not be disclosed without your consent.

Thank you.

Part 1: General Information Survey. There is a total of 7 questions. Please mark "√" on the appropriate option according to your actual situation.

Single-choice questions

1. Your gender:

A. Male

B. Female

2. Your Year level:

A. First year of undergraduate

B. Second year of undergraduate

C. Third year of undergraduate

D. Fourth year of undergraduate

3. Your major:

- A. Humanities and Social Sciences
- B. Science and Engineering
- C. Art
- D. Others

4. Which teaching mode do you prefer?

- A. Online learning
- B. Face-to-face teaching
- C. Blended learning
- D. Others

Multiple-choice questions:

5. The online learning platforms your teacher uses for conducting classes are:

- A. Tencent Meeting
- B. Rain Class
- C. FyChaoxing
- D. DingDing
- E. WeChat
- F. QQ
- G. Others

6. The English learning platform you use are:

- A. WE Learn
- B. U Campus
- C. Speexx
- D. Rain Class
- E. FyChaoxing
- F. DingDing
- G. Others

7. The main forms of online learning you experienced from 2019 to 2022 are:

- A. Home-based online learning
- B. School-based online learning
- C. Quarantine-based online learning
- D. Other

Part II

Questionnaire 1: Students' learning engagement in College English online Teaching during the Pandemic in China.

This scale adopts a Likert 5-point scoring system, with all items being single-choice questions. The options are as follows:

1. This statement is never true for me.
2. This statement is usually not true for me.
3. This statement is sometimes true for me.
4. This statement is usually true for me.
5. This statement is completely true for me.

Scores are assigned as "1, 2, 3, 4, 5" respectively.

1. I was satisfied with the effect of my English online classes.
2. I was willing to invest more time in online English learning.
3. When studying online, I adopted different learning strategies for listening, speaking, reading, and writing in English.
4. I deepened my understanding of English listening and dialogue through online video materials.
5. I improved my spoken English by practicing pronunciation through online learning software.
6. I could enrich and expand my understanding of English texts by utilizing online links that provide background knowledge.
7. I would conscientiously complete various assignments on the online English network system.
8. I had set up a plan for learning English online.
9. During online English classes, I prepared to answer the teacher's questions because they might randomly call on us.
10. I would interact and communicate with my English teacher by posting on platforms such as WeChat Work, online discussion forums, and message boards.
11. Feedback on my online assignments from the teacher encouraged me to improve my English learning.

12. I would collaborate with group members online to complete English learning tasks.
13. I would share online English learning materials (such as notes and multimedia resources) with other classmates.
14. I enjoyed learning on online platforms with abundant English resources.
15. I enjoyed interacting with teachers online about English issues.
16. I was willing to participate in various teaching activities organized during online English teaching.
17. During online classes, my English teacher used to send "laughing face" emojis in the online chat, which made me feel warm.
18. Before the teacher's online class, I would use online audio and video materials to preview the English texts in advance.
19. During online English classes, I would not engage in activities unrelated to English learning. (OLBE2)
20. During online English classes, I could focus on the course content for extended periods.
21. During online English classes, I could keep up with the pace of the teacher's live broadcast and lecture content.

Part III

Questionnaire 2: Factors influencing students' learning engagement in College English online Teaching during the Pandemic in China

1. My motivation for online learning was to improve my overall English proficiency.
 2. I was confident in completing online English learning tasks.
 3. I was confident in fully utilizing various English learning online systems to facilitate my learning.
 4. I was confident in overcoming difficulties and challenges in online English learning.
 5. I believed it was necessary to set goals for online English learning and implement them according to my plan.
 6. I believed I could manage and adjust my online learning goals and progress.
 7. I believed it was important to be able to assess my online English learning progress.
- (SS7)
8. Online English learning platforms such as WE Learn and U Campus helped me better engage in English learning.
 9. Various resources provided by online autonomous English learning platforms, such as listening and writing exercises, contributed to my English learning.
 10. The stability of online learning networks helped me better engage in English learning.
 11. Working on online English group projects with classmates benefited me.
 12. Classmates sharing online English learning resources to extend what I had learned was helpful to me.
 13. Sharing learning methods with classmates (or group members) could promote my better engagement in English learning.
 14. Seeing the homework results displayed by classmates online motivated me to participate more actively in English learning.
 15. Classmates helping me solve technical problems encountered during online English learning benefited me.
 16. Timely feedback from teachers in online discussion forums and course assignment areas could promote my English learning.

17. Diverse evaluation methods by my English teacher were beneficial for my participation in online learning.

18. Teachers providing short videos related to the textbook for processing and elaborating on the teaching content helps with my English learning.

19. Teachers actively listening to my difficulties in online English learning can promote my better engagement in learning.

20. Encouragement and praise from teachers during online learning motivate me to better engage in English learning.

21. The "suspending classes without suspending learning" policy implemented by the country during the epidemic was beneficial to my English learning.

22. The university's management of online courses were advantageous for my English learning.

23. The technical consultation and guidance concerning online platforms offered by the university were beneficial to my English learning.

24. The daily online attendance check by the class advisor at school could motivate me to study.

25. The quiet study environment provided at home facilitated my English learning.

26. Reminders from my parents about online learning time was helpful for my English learning.

27. My parents helping me cope with the frustration of online learning was beneficial for me.

28. Open-ended Question

During the online learning period due to the epidemic, what do you think is the factor that has the greatest impact on your study? Briefly explain why.

Appendix B A Pilot Study

To ensure the reliability and validity of the main study, I first conducted a pilot study involving three trial tests between April 12 and May 16, 2024. The initial two tests identified several flaws in the questionnaire items and anomalous student responses, leading to subsequent revisions. This appendix documents the results of the third trial.

B.1 Descriptive Statistics of Questionnaire 1 and Questionnaire 2

This study utilized SPSS 26.0 to perform descriptive statistics on the initially selected 31 and 30 indicators.

B.1.1 Table of questionnaire 1

Descriptive statistics									
	N	Least value	Peak value	Mean	Standard deviation	Skewness		Kurtosis	
	Statistics	Statistics	Statistics	Statistics	Statistics	Statistics	Standard error	Statistics	Standard error
a1	82	1	5	3.48	.933	.026	.266	.014	.526
a2	82	2	5	4.11	.832	-.342	.266	-1.119	.526
a3	82	2	5	3.72	.920	-.285	.266	-.692	.526
a4	82	1	5	3.74	.900	-.507	.266	.104	.526
a5	82	2	5	3.80	.895	-.449	.266	-.436	.526
a6	82	1	5	3.76	.910	-.599	.266	.156	.526
a7	82	2	5	3.96	.823	-.476	.266	-.234	.526
a8	82	2	5	3.98	.720	-.371	.266	.097	.526
a9	82	2	5	3.99	.809	-.408	.266	-.377	.526
a10	82	2	5	4.00	.754	-.355	.266	-.229	.526
a11	82	2	5	3.82	.862	-.344	.266	-.470	.526
a12	82	2	5	3.89	.846	-.538	.266	-.121	.526
a13	82	2	5	4.07	.828	-.406	.266	-.754	.526
a14	82	1	5	2.98	1.122	-.005	.266	-.751	.526
a15	82	1	5	3.48	.864	-.276	.266	-.070	.526
a16	82	1	5	3.55	.905	-.098	.266	-.251	.526
a17	82	2	5	3.77	.821	-.092	.266	-.614	.526
a18	82	2	5	3.87	.828	-.278	.266	-.503	.526
a19	82	2	5	3.76	.897	-.126	.266	-.821	.526
a20	82	2	5	3.80	.867	-.306	.266	-.533	.526
a21	82	2	5	3.80	.793	-.092	.266	-.572	.526
a22	82	1	5	3.60	.980	-.482	.266	-.116	.526
a23	82	1	5	3.39	1.152	-.420	.266	-.556	.526
a24	82	1	5	3.44	1.156	-.684	.266	-.176	.526
a25	82	1	5	3.79	.913	-.671	.266	.718	.526
a26	82	1	5	3.83	.979	-.780	.266	.750	.526
a27	82	2	5	3.80	.853	-.101	.266	-.785	.526
a28	82	1	5	3.80	.881	-.492	.266	.212	.526
a29	82	1	5	3.87	.828	-.545	.266	.673	.526
a30	82	2	5	3.90	.811	-.103	.266	-.858	.526
a31	82	2	5	3.93	.828	-.262	.266	-.663	.526
Valid cases (in rows)	82								

Item 14 was found to have a mean value below 3.0 and was deemed unsuitable for such analysis; consequently, it was excluded. The remaining 30 valid and measurable indicators

were then analysed. As shown in the table, the mean values ranged from 3.39 to 4.11. Judging by the skewness and kurtosis values, all influencing factors approximately followed a normal distribution.

B.1.2 Table of Questionnaire 2

Descriptive statistics									
	N	Least value	Crest value	Average value	Standard deviation	Skewness		Kurtosis	
	Statistics	Statistics	Statistics	Statistics	Statistics	Statistics	Standard error	Statistics	Standard error
b1	82	2	5	3.91	.724	-.270	.266	-.088	.526
b2	82	2	5	3.95	.701	-.373	.266	.269	.526
b3	82	2	5	4.00	.648	-.558	.266	1.262	.526
b4	82	2	5	4.01	.711	-.439	.266	.290	.526
b5	82	2	5	4.01	.657	-.280	.266	.254	.526
b6	82	3	5	4.07	.644	-.066	.266	-.533	.526
b7	82	3	5	4.02	.628	-.017	.266	-.387	.526
b8	82	1	5	4.02	.753	-.929	.266	2.376	.526
b9	82	1	5	3.99	.762	-.839	.266	2.003	.526
b10	82	1	5	3.91	.834	-.751	.266	1.019	.526
b11	82	1	5	3.83	.858	-.863	.266	1.552	.526
b12	82	1	5	3.98	.801	-.695	.266	1.186	.526
b13	82	1	5	4.02	.831	-.840	.266	1.219	.526
b14	82	2	5	3.95	.768	-.418	.266	-.046	.526
b15	82	2	5	3.88	.776	-.271	.266	-.301	.526
b16	82	2	5	3.90	.747	-.203	.266	-.350	.526
b17	82	2	5	3.94	.709	-.126	.266	-.416	.526
b18	82	2	5	3.95	.665	-.205	.266	.054	.526
b19	82	2	5	3.98	.720	-.371	.266	.097	.526
b20	82	2	5	3.93	.733	-.077	.266	-.637	.526
b21	82	2	5	3.90	.780	-.308	.266	-.281	.526
b22	82	3	5	4.04	.675	-.043	.266	-.752	.526
b23	82	3	5	4.01	.676	-.014	.266	-.756	.526
b24	82	2	5	3.93	.766	-.380	.266	-.087	.526
b25	82	1	5	3.89	.770	-.806	.266	1.758	.526
b26	82	2	5	3.91	.773	-.344	.266	-.188	.526
b27	82	1	5	3.82	.862	-.817	.266	1.414	.526
b28	82	2	5	4.11	.703	-.375	.266	-.139	.526
b29	82	1	5	3.85	.877	-1.060	.266	1.725	.526
b30	82	1	5	3.82	.862	-.580	.266	.472	.526
Valid cases (in columns)	82								

Questionnaire 2 (30 items) showed that there were no extreme values, and all items met the standards.

B.2 Correlation between Item Scores and Total Scale Scores in Questionnaire 1 and Questionnaire 2

Correlations between each item and the total score					
Questionnaire1 Item	Correlation	Significance	Questionnaire2 Item	Correlation	Significance
a1	0.583	<.001	b1	0.748	<.001
a2	0.538	<.001	b2	0.728	<.001
a3	0.698	<.001	b3	0.734	<.001
a4	0.644	<.001	b4	0.723	<.001
a5	0.792	<.001	b5	0.717	<.001
a6	0.715	<.001	b6	0.726	<.001
a7	0.527	<.001	b7	0.786	<.001
a8	0.442	<.001	b8	0.666	<.001
a9	0.577	<.001	b9	0.795	<.001
a10	0.654	<.001	b10	0.820	<.001
a11	0.733	<.001	b11	0.743	<.001
a12	0.705	<.001	b12	0.775	<.001
a13	0.679	<.001	b13	0.714	<.001
a15	0.672	<.001	b14	0.776	<.001
a16	0.741	<.001	b15	0.808	<.001
a17	0.733	<.001	b16	0.756	<.001
a18	0.772	<.001	b17	0.771	<.001
a19	0.797	<.001	b18	0.728	<.001
a20	0.762	<.001	b19	0.778	<.001
a21	0.705	<.001	b20	0.826	<.001
a22	0.654	<.001	b21	0.817	<.001
a23	0.307	0.005	b22	0.810	<.001
a24	0.306	0.005	b23	0.810	<.001
a25	0.695	<.001	b24	0.753	<.001
a26	0.632	<.001	b25	0.694	<.001
a27	0.687	<.001	b26	0.742	<.001
a28	0.731	<.001	b27	0.653	<.001
a29	0.730	<.001	b28	0.714	<.001
a30	0.775	<.001	b29	0.721	<.001
a31	0.710	<.001	b30	0.725	<.001

B.3 Reliability Statistics for Questionnaires 1 and 2

Generally, a higher α value indicates better internal consistency of the scale. In practical applications, an α value of 0.7 is typically considered acceptable

Questionnaire	Cronbach's Alpha	Number of Items
Questionnaire 1	.958	28
Questionnaire 2	.973	30

Note: This table presents the internal consistency reliability coefficients (Cronbach's Alpha) for the two questionnaires used in the study.

B.4 Table of KMO and Bartlett's Test Results for Questionnaires 1 and 2

Questionnaire	KMO Measure of Sampling Adequacy	Bartlett's Test of Sphericity		
		Approx. Chi-Square	df	Sig.
1	0.852	2004.343	378	.000
2	0.848	2755.943	435	.000

Note: KMO = Kaiser-Meyer-Olkin. A KMO value above 0.8 is generally considered meritorious. A significant Bartlett's Test (Sig. < .05) indicates that the data is suitable for factor analysis.

B.5 Exploratory Factor Analysis

Questionnaire 1

B.5.1 Table of Communalities

This table displays the proportion of variance in each original variable (a1-a31) that can be explained by the extracted common factors. A higher "Extraction" value indicates a stronger relationship between the variable and the common factors, meaning it is better represented by the latent factor structure.

Communalities		
	initial	draw
a1	1.000	.554
a2	1.000	.527
a3	1.000	.868
a4	1.000	.820
a5	1.000	.782
a6	1.000	.623
a7	1.000	.761
a8	1.000	.690
a9	1.000	.436
a10	1.000	.614
a11	1.000	.692
a12	1.000	.734
a13	1.000	.728
a15	1.000	.596
a16	1.000	.729
a17	1.000	.771
a18	1.000	.742
a19	1.000	.838
a20	1.000	.687
a21	1.000	.673
a22	1.000	.763
a25	1.000	.724
a26	1.000	.768
a27	1.000	.680
a28	1.000	.821

Communalities		
	initial	draw
a29	1.000	.820
a30	1.000	.784
a31	1.000	.721
Extraction method: principal component analysis method.		

B.5.2 Table of Total Variance Explained

Total variance interpretation									
Ingredient	Initial eigenvalue			The sum of the load squares was extracted			Sum of the rotating load squares		
	Amount to	Variance percentage	Accumulate%	Amount to	Variance percentage	Accumulate%	Amount to	Variance percentage	Accumulate%
1	13.360	47.716	47.716	13.360	47.716	47.716	5.668	20.241	20.241
2	1.996	7.129	54.844	1.996	7.129	54.844	4.366	15.592	35.834
3	1.918	6.849	61.693	1.918	6.849	61.693	3.654	13.051	48.885
4	1.469	5.247	66.940	1.469	5.247	66.940	3.256	11.629	60.513
5	1.203	4.297	71.237	1.203	4.297	71.237	3.003	10.724	71.237
Extraction method: principal component analysis method.									

The Total Variance Explained (Appendix B.5.2) identified five factors with eigenvalues greater than 1, accounting for 71.237% of the total variance.

B.5.3 Table of Rotated Factor Loadings and Resulting Factor Labels

Component matrix ^a					
	Ingredient				
	1	2	3	4	5
a 5	.799				
a 19	.786				
a 30	.784				
a 20	.764				
a 18	.760				
a 16	.753				
a 29	.744				
a 11	.735				
a 17	.734				
a 28	.728				
a 12	.726				
a 31	.726				
a 6	.717				
a 3	.709				
a 27	.706				
a 13	.693				
a 21	.692				
a 25	.691				
a 15	.685				
a 10	.656				
a 4	.654			-.513	
a 22	.648				
a 26	.619			.520	

Component matrix ^a					
a 9	.587				
a 1	.584				
a 2	.545				
a 7	.528	.586			
a 8		.563			
Extraction method: principal component analysis method.					
a. Five components were extracted.					

The component matrix after the rotation ^a					
	Ingredient				
	1	2	3	4	5
a 19	.827				
a 22	.772				
a 17	.741				
a 21	.736				
a 18	.727				
a 16	.699				
a 20	.684				
a 15	.623				
a 6					
a 28		.747			
a 29		.730			
a 26		.722			
a 30		.697			
a 27		.691			
a 25		.632	.522		
a 31		.553	.546		
a 12			.722		
a 13			.681		
a 11			.644		
a 10			.567		
a 4				.825	
a 3				.812	
a 1				.580	
a 5				.518	
a 7					.815
a 8					.803
a 2					.539
a 9					
Extraction method: principal component analysis method.					
Rotation method: Caesar normal maximum variance method.					
a. The rotation has converged after 8 iterations.					

A Varimax rotation clarified the factor structure (Appendix B.5.3), with most items loading strongly (> 0.5) on one factor.

In the end, five factors were extracted, representing five dimensions.

Questionnaire 2

B.5.4 Table of Communality of 30 items

Communality		
	Initial	Draw
b1	1.000	.780
b2	1.000	.744
b3	1.000	.810
b4	1.000	.872
b5	1.000	.822
b6	1.000	.790
b7	1.000	.784
b8	1.000	.658
b9	1.000	.770
b10	1.000	.854
b11	1.000	.604
b12	1.000	.810
b13	1.000	.812
b14	1.000	.653
b15	1.000	.793
b16	1.000	.747
b17	1.000	.757
b18	1.000	.758
b19	1.000	.745
b20	1.000	.821
b21	1.000	.736
b22	1.000	.806
b23	1.000	.785
b24	1.000	.786
b25	1.000	.850
b26	1.000	.738
b27	1.000	.784
b28	1.000	.703
b29	1.000	.839
b30	1.000	.870
Extraction method: principal component analysis method.		

The rotated solution (Appendix B.5.4) showed a clear factor structure, with most items loading strongly (> 0.5) on one factor.

B.5.5 Table of Total Variance Explained

Total variance interpretation									
Ingredient	Initial eigenvalue			The sum of the load squares was extracted			Sum of the rotating load squares		
	Amount to	Variance percentage	Accumulate%	Amount to	Variance percentage	Accumulate%	Amount to	Variance percentage	Accumulate%
1	17.034	56.779	56.779	17.034	56.779	56.779	7.220	24.067	24.067
2	2.034	6.779	63.558	2.034	6.779	63.558	4.650	15.499	39.566
3	1.562	5.206	68.764	1.562	5.206	68.764	4.631	15.438	55.004
4	1.434	4.781	73.545	1.434	4.781	73.545	3.755	12.516	67.520
5	1.215	4.051	77.596	1.215	4.051	77.596	3.023	10.076	77.596
Extraction method: principal component analysis method.									

The Total Variance Explained (Appendix B.5.5) revealed five factors with eigenvalues greater than 1, which collectively accounted for 77.596% of the total variance.

B.5.6 Table of Rotated Factor Loadings and Resulting Factor Labels

Component matrix ^a					
	Ingredient				
	1	2	3	4	5
b20	.834				
b21	.821				
b22	.818				
b23	.817				
b15	.813				
b10	.813				
b7	.793				
b9	.793				
b19	.786				
b17	.779				
b14	.777				
b12	.772				
b16	.764				
b24	.745				
b1	.744				
b11	.742				
b26	.738				
b18	.737				
b3	.737				
b6	.733				
b2	.728				
b4	.727				
b5	.717				
b30	.714				
b28	.710				
b29	.709				
b13	.705				
b25	.692				
b8	.665				
b27	.638		.505		
Extraction method: principal component analysis method.					

Component matrix ^a					
a. Five components were extracted.					

The component matrix after the rotation ^a					
	Ingredient				
	1	2	3	4	5
b20	.777				
b18	.774				
b17	.766				
b16	.762				
b22	.739				
b23	.728				
b19	.728				
b15	.724				
b21	.634				
b14	.540				
b7	.521	.503			
b4		.832			
b5		.784			
b3		.749			
b6		.703			
b2		.661			
b1		.606			.514
b12			.755		
b13			.750		
b10			.737		
b9			.687		
b8			.644		
b11					
b25				.797	
b27				.781	
b24				.706	
b26				.686	
b30					.797
b29					.773
b28					.642
Extraction method: principal component analysis method.					
Rotation method: Caesar normal maximum variance method.					
a. The rotation has converged after 6 iterations.					

In the end, five factors were extracted, representing five supporting factors.

B.6 The Internal Consistency Reliability of Each Dimension

B.6.1 Summary of Reliability Analysis for Questionnaire 1

Dimension	Number of Items	Cronbach's Alpha	Internal Consistency	Key Findings & Action
Cognitive Engagement	8	.925	Excellent	All items showed strong correlations with the total score (Corrected Item-Total Correlation > 0.4). The scale is highly reliable.
Interactive Engagement	5	.900	Excellent	All items showed strong correlations with the total score (Corrected Item-Total Correlation > 0.4). The scale is highly reliable.
Affective Engagement	4	.848	Good	All items showed acceptable to strong correlations with the total score (Corrected Item-Total Correlation > 0.4). The scale is reliable.
Behavioural Engagement	4	.883	Good to Excellent	All items showed strong correlations with the total score (Corrected Item-Total Correlation > 0.4). The scale is highly reliable.
Time Management	3	.760	Acceptable	Low Reliability. Item a2 has a weak correlation (.477). Removing any item does not improve Alpha sufficiently. Remove this entire dimension from the final scale due to questionable reliability.

Cronbach's alpha values for Dimensions 1-5 were 0.925, 0.900, 0.848, 0.883, and 0.760, respectively. For Dimensions 1-4, all corrected item-total correlations exceeded 0.4, confirming strong homogeneity.

B.6.2 Summary of Reliability Analysis for Questionnaire 2 (Support Factors)

Dimension	Number of Items	Cronbach's Alpha	Internal Consistency	Key Findings
Self-Support	10	.959	Excellent	All items showed very strong correlations with the total score (Corrected Item-Total Correlation > 0.74). The scale has exceptional reliability.
Teacher Support	5	.922	Excellent	All items showed strong correlations with the total score (Corrected Item-Total Correlation > 0.69). The scale is highly reliable.
Peer Support	5	.927	Excellent	All items showed strong to very strong correlations with the total score (Corrected Item-Total Correlation > 0.69). The scale is highly reliable.
Institutional Support	4	.903	Excellent	All items showed strong correlations with the total score (Corrected Item-Total Correlation > 0.75). The scale is highly reliable.
Family Support	3	.897	Good to Excellent	All items showed strong correlations with the total score (Corrected Item-Total Correlation > 0.72). The scale is reliable.

All corrected item-total correlations were strong, confirming consistent construct measurement.

Appendix C Validation of Statistical Data

C.1 Table of Reliability Analysis of Questionnaires

Questionnaire	Dimension	Code	Number of Items	Dimension Cronbach's α	Total Cronbach's α
Online Learning Engagement	Online Cognitive Engagement	OLCE	8	0.902	0.953
	Online Interactive Engagement	OLIE	5	0.836	
	Online Affective Engagement	OLAE	4	0.806	
	Online Behavioural Engagement	OLBE	4	0.873	
Influencing Factors	Self-Support	SS	10	0.941	0.933
	Peer Support	PS	5	0.906	
	Teacher Support	TS	5	0.928	
	Institutional Support	IS	4	0.875	
	Family Support	FS	3	0.845	

Note: All Cronbach's Alpha values exceed the recommended threshold of 0.7, indicating good to excellent internal consistency reliability for all scales and subscales.

C.2 Table of Convergent Validity Analysis of the Measurement Model

Construct	Code	Question Item	Factor Loading	Average Variance Extracted (AVE)	Composite Reliability (CR)
Online Learning Engagement					
Online Learning Cognitive Engagement	OLCE	OLCE1	0.617	0.541	0.904
		OLCE2	0.758		
		OLCE3	0.766		
		OLCE4	0.736		
		OLCE5	0.738		
		OLCE6	0.761		
		OLCE7	0.745		
		OLCE8	0.753		
Online Learning Interactive Engagement	OLIE	OLIE1	0.649	0.504	0.835
		OLIE2	0.777		
		OLIE3	0.694		
		OLIE4	0.751		
		OLIE5	0.670		
Online Learning Affective Engagement	OLAE	OLAE1	0.679	0.543	0.821
		OLAE2	0.843		
		OLAE3	0.858		
		OLAE4	0.515		
Online Learning Behavioural Engagement	OLBE	OLBE1	0.756	0.644	0.879
		OLBE2	0.789		
		OLBE3	0.862		

Construct	Code	Question Item	Factor Loading	Average Variance Extracted (AVE)	Composite Reliability (CR)
		OLBE4	0.800		
Influencing Factors					
Self-Support	SS	SS1	0.743	0.616	0.941
		SS2	0.796		
		SS3	0.801		
		SS4	0.768		
		SS5	0.756		
		SS6	0.809		
		SS7	0.805		
		SS8	0.774		
		SS9	0.813		
		SS10	0.780		
Peer Support	PS	PS1	0.791	0.663	0.908
		PS2	0.843		
		PS3	0.813		
		PS4	0.830		
		PS5	0.793		
Teacher Support	TS	TS1	0.845	0.715	0.926
		TS2	0.841		
		TS3	0.841		
		TS4	0.864		
		TS5	0.836		
Institutional Support	IS	IS1	0.847	0.651	0.881
		IS2	0.839		
		IS3	0.841		
		IS4	0.689		
Family Support	FS	FS1	0.788	0.650	0.848

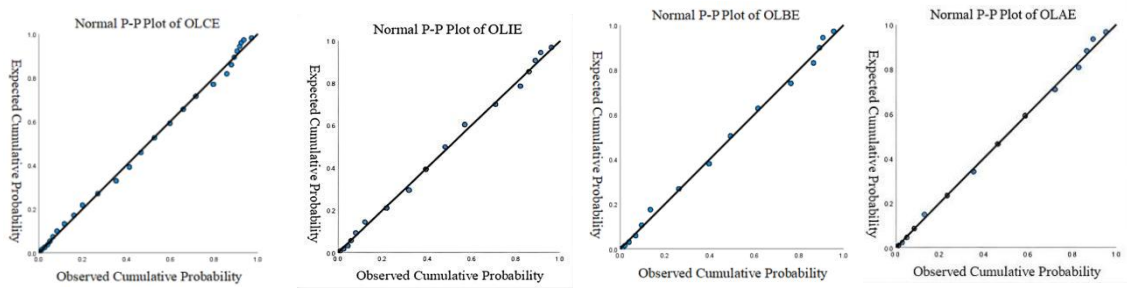
Note: Convergent validity measures the relationship between observed variables and latent variables. It requires checking the Average Variance Extracted (AVE) and the Composite Reliability (CR). When AVE is greater than 0.50 and CR exceeds 0.80, the measure exhibits ideal convergent validity.

C.3 Table of Discriminant Validity Analysis of the Measurement Model

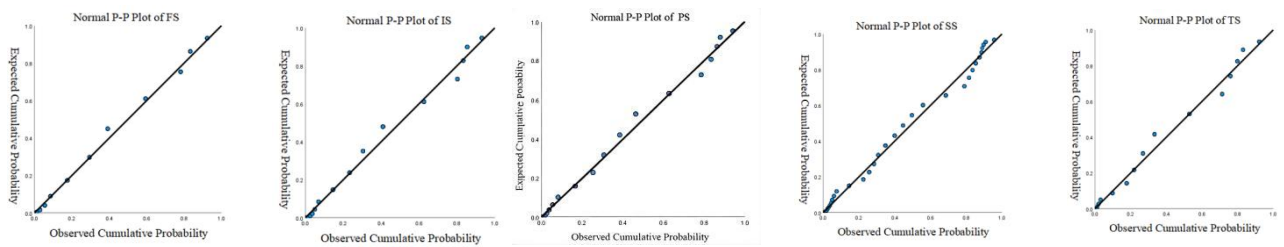
Construct	1	2	3	4	5	6	7	8	9
A. Online Learning Engagement									
1. OLBE	0.803								
2. OLAE	0.415	0.737							
3. OLIE	0.384	0.349	0.710						
4. OLCE	0.363	0.317	0.288	0.736					
B. Influencing Factors									
5. FS	0.449	0.413	0.336	0.353	0.806				
6. IS	0.413	0.438	0.464	0.436	0.331	0.807			
7. TS	0.336	0.438	0.420	0.372	0.353	0.464	0.845		
8. PS	0.353	0.464	0.420	0.411	0.331	0.436	0.372	0.814	
9. SS	0.331	0.436	0.372	0.411	0.424	0.436	0.372	0.411	0.785

Note: Diagonal elements (in bold) are the square roots of the Average Variance Extracted (AVE). Off-diagonal elements are the squared correlations between constructs. Discriminant validity is established when the diagonal element is greater than the off-diagonal elements in the same row and column.

C.4 Verification of the Normal Distribution



Normal p-p plot of the four dimensions of student online engagement



Normal p-p plot of five supporting factors of student online engagement

It was evident that the lines in each p-p graph of each dimension and the five influencing factors in the scales were positively linearly correlated, and the scatter plots of variables were all near or close to the lines.

Appendix D Descriptive Analysis of the Items in Questionnaire 1 and Questionnaire 2

Descriptive Statistics						
Item	N	Minimum	Maximum	Mean	Standard Deviation	Satisfaction Percentage
OLCE1	502	1	5	3.29	0.95	65.80%
OLCE2	502	1	5	3.46	0.899	69.20%
OLCE3	502	1	5	3.53	0.966	70.60%
OLCE4	502	1	5	3.6	0.916	72.00%
OLCE5	502	1	5	3.53	0.957	70.60%
OLCE6	502	1	5	3.52	0.949	70.40%
OLCE7	502	1	5	3.48	0.986	69.60%
OLCE8	502	1	5	3.22	1.055	64.40%
OLIE1	502	1	5	3.83	0.92	76.60%
OLIE2	502	1	5	3.36	0.993	67.20%
OLIE3	502	1	5	3.76	0.933	75.20%
OLIE4	502	1	5	3.48	1.022	69.60%
OLIE5	502	1	5	3.6	0.982	72.00%
OLAE1	502	1	5	3.7	0.937	74.00%
OLAE2	502	1	5	3.27	1.045	65.40%
OLAE3	502	1	5	3.39	1.022	67.80%
OLAE4	502	1	5	3.92	0.946	78.40%

Descriptive Statistics						
Item	N	Minimum	Maximum	Mean	Standard Deviation	Satisfaction Percentage
OLBE1	502	1	5	3.31	0.996	66.20%
OLBE2	502	1	5	3.54	0.948	70.80%
OLBE3	502	1	5	3.46	0.914	69.20%
OLBE4	502	1	5	3.65	0.868	73.00%
SS1	502	1	5	3.74	0.878	74.80%
SS2	502	1	5	3.73	0.844	74.60%
SS3	502	1	5	3.64	0.875	72.80%
SS4	502	1	5	3.61	0.906	72.20%
SS5	502	1	5	3.81	0.833	76.20%
SS6	502	1	5	3.64	0.857	72.80%
SS7	502	1	5	3.79	0.802	75.80%
SS8	502	1	5	3.64	0.931	72.80%
SS9	502	1	5	3.75	0.831	75.00%
SS10	502	1	5	3.86	0.832	77.20%
PS1	502	1	5	3.69	0.884	73.80%
PS2	502	1	5	3.75	0.828	75.00%
PS3	502	1	5	3.72	0.89	74.40%
PS4	502	1	5	3.77	0.882	75.40%
PS5	502	1	5	3.79	0.873	75.80%
TS1	502	1	5	3.83	0.818	76.60%
TS2	502	1	5	3.95	0.768	79.00%
TS3	502	1	5	3.94	0.761	78.80%
TS4	502	1	5	4.01	0.775	80.20%
TS5	502	1	5	4.02	0.801	80.40%
IS1	502	1	5	3.84	0.9	76.80%
IS2	502	1	5	3.8	0.863	76.00%
IS3	502	1	5	3.81	0.852	76.20%
IS4	502	1	5	3.71	0.912	74.20%
FS1	502	1	5	3.92	0.851	78.40%
FS2	502	1	5	3.65	1.025	73.00%
FS3	502	1	5	3.74	0.929	74.80%

Appendix E Differences Analysis

E.1 Gender

Dimension	Male (N=211)		Female (N=291)		t	p
	Mean value	Standard deviation	Mean value	Standard deviation		
OLCE	3.4893	0.79753	3.4278	0.69631	0.919	0.072
OLIE	3.6540	0.80233	3.5711	0.71708	1.216	0.048
OLAE	3.6043	0.84609	3.5438	0.74017	0.850	0.005
OLBE	3.5178	0.79656	3.4725	0.79200	0.631	0.997
The general level	3.5664	0.74034	3.5038	0.65940	0.996	0.042

E.2 Major

Dimension	Liberal Arts (N=111)		Sciences (N=337)		t	p
	Mean value	Standard deviation	Mean value	Standard deviation		
OLCE	3.2387	0.68952	3.5486	0.73958	-3.892	0.366
OLIE	3.3730	0.65974	3.7021	0.76019	-4.082	0.030
OLAE	3.4099	0.67823	3.6402	0.79725	-2.734	0.035
OLBE	3.2207	0.71489	3.5853	0.79054	-4.312	0.390
The general level	3.3106	0.58030	3.6190	0.70314	-4.176	0.020

E.3 Year of Study

Variable	Year of study	mean value	Standard deviation	F	p
OLCE	Year 2	3.4056	0.69917	1.553	0.213
	Year 3	3.5409	0.80012		
	Year 4	3.4949	0.78224		
OLIE	Year 2	3.5938	0.73383	1.577	0.208
	Year 3	3.7062	0.78970		
	Year 4	3.5273	0.76849		
OLAE	Year 2	3.5276	0.77265	1.240	0.290
	Year 3	3.6637	0.82698		
	Year 4	3.5833	0.77591		
OLBE	Year 2	3.4422	0.77810	2.727	0.066
	Year 3	3.6438	0.79043		
	Year 4	3.4621	0.82713		
The general level	Year 2	3.4923	0.67073	1.834	0.161
	Year 3	3.6387	0.73480		
	Year 4	3.5169	0.71017		

Appendix F Interview Outline

F.1 Interview Outline for Students

1. How do you feel about the overall English online learning experience? Please illustrate it.

Prompt: in that process

1) How do you feel about the transition of English class from traditional classroom learning to online learning?

2) How do you feel about the online in-class learning? Pleasant, satisfied, bored?

3) How do you feel about the online out-of-class learning?

4) How do you cope with negative emotions in online learning?

2. What is your greatest motivation for online English learning?

Probe:

1) What are the primary factors affecting your motivation to learn?

2) How does the online learning environment affect your motivation?

3) How does the teacher affect your motivation?

3. To what extent do you believe that you can overcome challenges and setbacks encountered in online English learning? Please elaborate it.

Probe:

1) How confident are you in your ability to effectively navigate online learning platforms and tools?

2) To what extent do you believe that you can successfully complete online learning tasks and assignments?

3) How confident are you in your ability to manage your time effectively while participating in online courses?

4. To what extent do you feel a sense of autonomy and control over your English learning in online environments?

Probe:

1) Can you regulate your own online learning according to your own pace?

2) Do you need the teacher or classmates to remind you to complete online assignments?

3) Have you a goal about your online learning? If yes, do you track your progress online towards achieving them?

5. What factors do you think will affect the effectiveness or quality of your online learning?

Prompt:

1) How about the effect of the interaction between you and the teacher?

2) How about the effect of the interaction between you and your classmates?

6. What do you think of the learning platform or learning software you are engaged in?

Probe:

1) Are they user-friendly?

2) Do you benefit a lot from using them?

6. Which environmental factor has the greatest impact on your online English learning state? Can you give me an example to explain it?

7. What other factors that we have not mentioned do you think will affect the effectiveness or quality of your online learning?

F.2 Interview Outline for Teachers

1. How did you adjust yourself to online teaching at the beginning of the lockdown period?

Probe:

1) Was it hard for you to prepare online teaching content for students?

2) What online teaching platform do you find most helpful in teaching English online?

3) Were there technological problems? How did you solve it?

2. How do you view your role as a teacher in students' online learning?

Probe:

1) What makes your role change?

2) Is it easy for you to change your role?

3. In terms of teaching effect, which is better, face to face classroom teaching or online teaching?

4. How do you devise your online course?

Probe:

1) Will you tailor the content according to learning preferences of your students?

2) Will you incorporate images, videos, audio clips, and interactive elements to enhance engagement?

5. How do you interact with your students in online setting?

Probe:

1) What kind of form you use to interact with students?

2) What do you think of the students' interaction with you in online classes?

6. How do you evaluate your students' online performance?

Probe:

1) What is the proportion of your students' ordinary performance in their final exam?

2) Do you periodically assess students' learning progress on the learning platform?

7. How do you ensure that students maintain motivation and focus in online English classes?

Probe: Can you give an example to show how you attract your students' attention in online classes?

8. What do you think are the main factors influencing the effect of students' online learning?

Closing out: Is there anything else you would like to share that may be related to online College English teaching that we have not discussed?

Appendix G Interview Consent Form

Title of the Study:

College English Online Teaching during the Pandemic in China: A Perspective on Student Learning Engagement

Principal Investigator: Host (Researcher)

Introduction:

You are being invited to participate in an interview as part of the research study. Before deciding to participate, it is essential that you understand the purpose of the study, what your involvement will entail, and any potential risks or benefits. Please read this consent form carefully and take the time to ask any questions that you may have before deciding to participate.

Purpose of the Study:

The purpose of this study is to explore the situation of online College English online teaching under the pandemic. The information collected from this interview will be used to analyse the student engagement in the online English classes.

Procedure:

If you agree to participate, you will be invited as an interviewee. Your participation is entirely voluntary, and you may choose not to answer any question(s) that you do not wish to.

Confidentiality:

All the information collected from this interview will be kept strictly confidential. Your responses will be anonymized and reported in aggregate form, which means no personally identifiable information will be disclosed in any publications or reports. Only the research team will have access to the data. Please note that there may be exceptions to confidentiality if required by law or as necessary to protect participants or others from immediate harm.

Potential Risks:

There are minimal risks associated with participating in this interview. While every

precaution will be taken to protect your data, the potential risks of a breach of confidentiality cannot be entirely eliminated. However, we have implemented appropriate safeguards to protect your information.

Please select

☐ I confirm that I have read and understood the introduction of the interview. I have had an opportunity to consider the information and what will be expected of me. I have also had the opportunity to ask questions which have been answered to my satisfaction.

☐ I hereby confirm that I understand the inclusion criteria as detailed in the interview and explained by the researcher.

☐ I voluntarily agree to take part in this study.

Your signature:

Date:

Appendix H Illustrative Transcripts

H.1 Illustrative Student Interview Transcript

This transcript was translated into English by the researcher.

Interviewer: Host (Researcher)

Interviewee: S1 (Student)

Gender: Female

Major: Chinese Language and Literature (undergraduate program)

Time: 18:00-18:35, June 13, 2024

Location: International Office Conference Room

Host: Please mute your phone first. Before we begin, could you please take a moment to read the informed consent form? We will strictly protect your data and privacy. If you agree, I'll ask you to sign it later. First, I'll ask you some basic questions and test the recording quality.

Host: Now, let's start. How did you feel about your online English learning experience during the pandemic?

S1: At the beginning of the epidemic, I happened to be a high school student, so this feeling is still very deep, from the second half of my sophomore year, and almost the entire senior year. During this period, due to the pandemic, I returned home. English courses, including many other subjects, adopt an online learning approach. I personally feel that he actually has a significant impact on the overall learning state. For example, in the past, classes were held in the classroom, and the interaction between teachers and students was very convenient. However, on the internet, you cannot guarantee this very well. Because after all, it is not a normal one, just a physical distance, separated by screens and networks. There are some problems in the classroom, and there is no timely feedback between teachers and students.

Host: So, there may be some difficulties in communication and feedback, right?

S1: Yes, because it has a certain degree of latency and cannot provide a very timely response. Whether it is the teacher passing on this knowledge to the student, it will not

cause any problems.

Host: Is this feeling the same in university classrooms?

S1: In terms of college, it was basically back to normal during that time. And my English general courses in college were usually completed offline, but it also involved some online activities. For example, the kind of homework that is done every semester, similar to classroom assignments, is all done online because it is the learning style of universities, and it is unlikely to adopt the high school style of in class exams, which is very rare. So, I remember there was a software called Speex before, and we used it to take an English proficiency test and assign a corresponding assignment. This is a part that is closer to online. Overall, the learning of College English mainly involves some extracurricular aspects, which may involve online learning, and beyond that, it actually has an impact.

Host: What do you think the online part has brought you?

S1: It can be divided into many aspects, including some learning experiences. There are also some changes in learning methods, mainly in these areas.

Host: Let's talk about the changes in learning methods. Specifically, what kind of change do you think it is?

S1: Because traditional classrooms adopt a teacher led teaching system, basically you learn a lot in one class, and many things are displayed on the blackboard. If students have any questions in class, the teacher can help you answer them in a timely manner. But for online learning, the teacher who teaches you the course may not necessarily be your teacher at school. Or to put it another way, it could be this teacher whose electronic courses are accessible to many people. You are not a student who has a very close relationship with him, or you cannot have time to communicate with him. Moreover, online learning content is much richer than offline learning. For example, offline may be a dedicated class, and I am going to talk about the content of this section in today's unit, but online it breaks through the limitations of time and space. In addition to learning vocabulary, I can also learn grammar, and these are all things I can do for free through the internet. It can be obtained in a very simple way, so the entire learning scope has expanded and the learning channels have become more diverse. However, you may not necessarily be able to improve the accuracy of your learning, as it may lead to a kind of confusion similar to knowledge. You cannot accurately grasp your own learning plan.

Host: Regarding the expansion of the scope you just mentioned, is it also included in some of your extracurricular studies?

S1: Yes.

Host: That means you feel that the scope has expanded and the knowledge you are learning is not as precise anymore.

S1: Yes, that's a question, but he also has a good side and a good face.

Host: Do you think it's just the part of online learning? How do you feel? Are you satisfied with this online learning? Still unsatisfied? Or perhaps feeling bored, and so on, what about other emotions?

S1: My evaluation of him is quite objective, but if I were to lean more towards any aspect, I think he still has more advantages,

Host: That means you think it has some drawbacks, but overall, it is a progressive thing,

S1: Yes, overall, I think it's progress.

Host: In online learning? What motivates you to learn? Do you want to get a good grade? Or is it just a reason like wanting to excel in online learning?

S1: I think the first thing to consider is academic performance, because after all, my current identity is still student learning. Learning is not only my task, but also my pursuit. So, at least in terms of English learning, because it is not the native language of Chinese people, and I started relatively late, at the age of nine. Therefore, learning English is mainly for academic considerations, followed by personal ability improvement. Because I believe that mastering English as an internationally recognized language will be helpful for one's future, whether in job hunting or personal skill development. So, I think it's mainly these two aspects.

Host: Do you think the online learning environment can meet your learning motivation.

S1: To a large extent, it can be satisfied.

Host: Is there still a part that cannot be satisfied?

S1: As I mentioned before, maybe after you broaden your learning channels, but if there is no more scientific plan or clear roadmap for the object or aspect of your learning, you may think that I can learn this or that. So, which one should I choose?

Host: In that case, has the teacher given you some directions for online learning and provided guidance on this topic?

S1: It has happened before.

Host: Is this mainly for classroom learning now, or for self-directed learning, including extracurricular learning? Or are they all present?

S1: I think it's mainly in the aspect of autonomy.

Host: Can you be more specific about autonomy? How does the teacher guide you in self-directed learning?

Host: That means the teacher provided guidance on these methods for you. It can also encourage you to actively engage in these learning activities.

S1: Yes, that's how I feel. Actually, he doesn't have a deep understanding of this statement, I understand. However, sometimes I just feel that learning is indeed a magical thing. Perhaps after receiving some similar experiences, you may suddenly open up your mind and discover some new methods. very nice.

Host: Have you encountered any challenges or setbacks during your online learning process? Specifically, let me explain.

S1: Let me give an example based on my own experience. For example, it may enter a problem similar to a bottleneck period. I actually memorize vocabulary quite frequently in my daily life, and then I realize that for a period of time, your memory may be very good. You may remember a lot in a day, but suddenly after a while, you will find that your memory is noticeably worse than before. The number of words you remember has also decreased, and another prominent phenomenon is that in English, I have found many words that have the phenomenon of familiar words with obscure meanings. Including me, last year when I was preparing for the postgraduate entrance examination, I found that many words you recognized were difficult to translate when you put them into reading. That is to say, at least in terms of vocabulary, you may think that memorizing words is the most basic, but you will find that if you delve deeper into learning, you will find that there are many areas that you do not understand.

S1: For example, there is a significant difference between British and American culture and Chinese culture. Many words inside it do not have the same ideographic structure as Chinese characters. It has a deep cultural origin. For example, let me give you an example. This word is related to an image in a Western myth, right? At the beginning, when I saw this word, I thought how could it be related to another meaning. Later, when I looked it up,

I found out that it actually originated from a culture. So, due to cultural differences and possible deficiencies in methods. As a Chinese, I may have some blind spots in learning English, so sometimes the learning effect is not very ideal.

Host: That means you are in the process of learning vocabulary. What about online learning? It doesn't provide you with deeper cultural connections in the background, does it? That's the feeling.

S1: Yes, he just showed you Chinese gestures, and he just helped me understand what this word means? What do you mean? But in fact, this meaning often comes from reading. In the context. Yes, it is. It doesn't necessarily mean that.

Host: Isn't this feeling right? In fact, I suggest you read more English definitions for this situation.

Host: The English definition is the kind of Collins dictionary, and the English definition is the closest explanation to the meaning of the word itself. This is Chinese, but there is still an escape in it that may lose the original meaning of some words.

Host: It's like this. And then I saw that you think about this setback, do you think you can overcome it? Or do you think you have found a way to overcome it?

S1: Currently, we are still exploring, and there is another method. If I find it difficult to understand his meaning, I may use the internet, and I am also reading books that are original English works. I hope they can give me some cultural inspiration! Yes, if you want to learn a language, how do you have to say it? Be knowledgeable and broad-minded!

Host: Regarding the use of online learning platforms and tools. Do you think you can proficiently use them?

S1: I think this aspect is actually very lacking, very lacking,

Host: That means you don't have much confidence to use them well. Is that so?

S1: I think the key issue is that I am myself. Basically, I haven't had much exposure to that kind of multifunctional platform, and there is no personnel learning platform like this.

Host: What are the main platforms you usually interact with? For example, the school provides you with things like Speex and WeLearn. Is it?

S1: Actually, if I need to find some platforms or resources, it's usually those apps on my phone, such as the Daily English Listening app that can practice listening, and some other things that can practice reading, but it's not like the academic brands of particularly formal

websites. I'm really clear about this.

Host: Do you think you can complete the tasks and assignments assigned to you on online learning platforms well?

S1: I think I did a good job completing it myself, and the feedback from the teacher is the same. It should be the same.

Host: I believe it. How do you feel about your time management in online learning?

S1: I think time management is still very good, and I can memorize vocabulary for two hours every day.

Host: So, do you think this time management is based on the arrangement given to you by the teacher or do you have your own arrangement?

S1: It's largely my own arrangement, yes.

Host: So, you think you manage well, so the results are also good, right?

S1: Yes, I think I have done quite well in time management.

Host: Very good, then. So, the next question. Do you think we just mentioned that in English online learning, you will have many choices to make. Do you think there is a high degree of autonomy in this knowledge, that is to say, are you able to freely choose this knowledge? At the same time, how do you feel about your mastery of this knowledge?

S1: First of all. Can we choose this knowledge more freely? The first question is whether it is possible to choose this knowledge more freely. I feel that this aspect is not very ideal because there are actually various resources available nowadays. Not to mention the applications that specialize in English content nowadays, you can actually gain knowledge from many channels. Let me give you an example. I usually read that Little Red Book, which has many bloggers about English learning. There are indeed many people, such as those with high education, whose content is indeed helpful. I have practiced it, but some people say they can provide you with some advice on superficial things, but in fact, they are not very helpful to you. Because you may find that many people are actually college students, and their levels are similar. When choosing their experiences,

Host: Actually, it's not very substantial for oneself, and this method cannot be applied to them according to your situation. Customize like this.

S1: Yes.

Host: Do you think you can? In online learning, if there are some methods that you feel are

not suitable for you, such as other people's methods? Can you adjust according to your own situation?

S1: This part can be achieved.

Host: Can you give a specific example? What kind of adjustment is it?

S1: For example, if someone tells me that you need to prepare for an exam this month and memorize 150 words every day, then I will consider whether this sentence is truly suitable for me. Can I remember them all in my free time? If we can record them roughly, then which ones can be remembered more deeply, and which ones are simply forgotten at a glance. Then I will find out whether his study plan is suitable for my exam preparation situation, and we will do a screening. very nice.

Host: For example, online learning on campus? You must be able to complete this assignment on time, right? It's great that no one needs to remind you. If you were to study online, would you set goals for yourself?

S1: Yes, it does. For example, how many words do you memorize every day? If you look at foreign publications, it means how much you need to translate and accumulate.

Host: So, every time you study, do you measure yourself against achieving your previous goals?

S1: Yes, I will first set a plan for myself, then check it, and then examine whether the plan is designed reasonably. I will adjust it according to my own situation, which is great.

Host: Let me ask another question. What factors do you think affect the effectiveness and quality of online learning? For you, factors such as interactions with teachers and classmates?

S1: There are environmental factors, because a person's learning environment will definitely greatly affect the effectiveness of their learning. For example, when I am studying in the dormitory, I may be learning, I want to eat, I want to go out, but in the library, this situation will be much better.

Host: You're talking about the physical environment. Do you think the human environment, such as teachers and other classmates, will have an impact on you?

S1: Yes, and I think the influence among classmates will be even deeper. Isn't everyone now exploring a form of cooperative learning? I think if we can cooperate in English learning, it will actually be very helpful for our own learning.

Host: How do you feel about your interaction with them and the teacher? In terms of interaction, we have discussed how to remember words, or what steps reading is, and how to share learning methods with each other. What do you think of the effect?

S1: The effect is still there. For example, someone asked me before and said that your reading accuracy is quite high. How did you learn it? What methods are available online for you? That's one aspect. You need to immerse yourself first. You need to first develop a sense of the English language, and then you can talk about those so-called methods. If you talk about methods first. Yes, ignoring the linguistic nature of this language itself, I think even if there are any methods, they are just empty talk.

Host: That's right. yes. Do you think that combining other people's methods with your own adjustments can help you achieve your learning goals?

S1: It's very good to me.

Host: For some learning platforms and materials outside of school. Do you think they are convenient for users to use this? Is it okay? Is it convenient for users to use? Is it friendly?

S1: I'm using that Momo to memorize words. Let me talk about its advantages and disadvantages. Its overall corpus is very rich, it not only provides you with the Chinese definitions of words, but also involves some cultural extensions. Then there are some phrases and sentences that are paired together, even the authentic ones taken from some important newspapers and other media. It may be helpful in broadening your overall vocabulary learning perspective, but it also has a disadvantage of being relatively expensive compared to other vocabulary software. This may be a threshold; the threshold is here.

Host: That means the information and methods he provided are quite good, but relatively speaking, its threshold fee is also relatively high.

S1: That's the feeling, yes.

Host: Do you think it's just worth the money?

S1: I think it's worth the money, which means you also benefit a lot from it, right. Yes, because after all, it's about learning substantive content, which is knowledge payment. I think it's also appropriate.

Host: What we just mentioned are some environmental factors that affect you. I want to confirm again, do you think your classmates will have a deeper impact on your online

learning? When it comes to methods.

S1: Yes, because I remember starting from my junior year of college, I stopped studying general education in English. Therefore, I focused on the first two years of college life and only had one class per week. So, you may feel that compared to the interaction with the teacher, your classmates in the same class are actually less.

Host: It's like this. What other factors do you think could affect the effectiveness of your learning? What about the quality? Isn't that what was just mentioned?

S1: I think it may be an individual, and this subjective factor will have a greater impact, which is whether you have enthusiasm or not for language learning. Your feeling about language, and I also think that behind language learning, it is actually learning culture, it is a cultural exchange, which may be very important in my opinion,

Host: That is to say, first of all, it is your own motivation, yes, then your understanding of the learning background, and the self-efficacy you have gained during the learning process, which is a sense of achievement. It can be said that oneself and the content one is learning are mutually beneficial. While you can feel yourself constantly improving, it will also constantly push you forward to learn more deeply.

S1: This is a very genuine feeling.

Host: Let me ask again. What do you think are the needs of our current online learning? Do you have any suggestions, or do you think there are areas that need improvement? Do you have any suggestions for the curriculum design of learning platforms or the teaching of teachers? Can you provide it to me?

S1: Is this targeting the group of college students?

Host: It's your personal feelings; you can speak freely.

S1: In terms of platform settings, I still hope that teachers can promote it for students, because at least for undergraduate students, their academic level and ability to collect information are relatively limited. I hope that teachers can use their own experience to popularize some platforms that are more practical, have more complete functions, and are more valuable for English learning.

Host: What do you have about the platform itself? Do you have any areas that you think need improvement in? On the platform you are in contact with?

S1: My expectation for the platform is that its functions will be more comprehensive,

because English learning cannot be simply summarized in one or two sections. As I mentioned earlier, for example, word grammar, which means you need the platform to become more comprehensive, more integrated, and able to encompass listening, speaking, reading, and writing. In addition to cultivating these skills, it is best to also include learning about cultural backgrounds and strive for more comprehensive functionality. Yes, for example, providing you with some classic literature, or for example, providing you with some news. This feeling becomes a more comprehensive learning platform, which is how you think about it.

Host: So, for the teacher, did you just feel that the teacher needs to provide you with more guidance on online learning. Because the scope of the internet is too broad and the various types of information it contains are too complex, teachers need to screen it for you.

S1: It's all like this. I hope the teacher can provide us with guidance, because after all, the teacher has gone further on the path of learning than us. They may have more insights in this area and know more about what students need and what is less important.

Host: What do you think about the pure user experience? For both on campus and off campus platforms. Do you think this experience is okay?

S1: It's pretty good. In terms of experience, I hope that the layout of his information can be more concise, but this simplicity is not sufficient compared to the synthesis I just mentioned. That is to say, it needs more simplicity and stronger guidance to help you find what you need faster. Yes, it's about improving the efficiency of learning.

Host: Very good. Thanks!

H.2 Illustrative Teacher Interview Transcript

This transcript was translated into English by the researcher.

Interviewer: Host (Researcher)

Interviewee: T5 (Teacher)

Gender: Female

Profession: College English Teacher

Time: 16:00-16:26, June 31, 2024

Through Tencent Meeting

Host: How did you adapt to online teaching during the initial period of epidemic lockdown?

T5: Indeed, I felt a bit caught off guard at the time because I had almost never been exposed to online teaching software before. I had to adapt quickly and become familiar with these new tools bit by bit. Both teachers and students need to invest some effort in learning to use these applications. When I was not very familiar with it at the time, I would search for teaching strategies online, research them, and share them with students so that we could collaborate more effectively. At first, it was a bit difficult, but later on, I didn't expect this situation to last so long. Overall, it felt okay.

Host: Do you think it's difficult to prepare online teaching content for students?

T5: Actually, creating teaching content is not difficult, but the biggest challenge is how to enable students to receive online teaching like in traditional classrooms and achieve the purpose of assessment. We are teaching in large classes, with 60-70 students in each class, so we cannot pay attention to every student. We cannot see their micro expressions, cannot know what they are doing, or whether they are dozing off. I have always found this problem difficult to solve and have not found an effective solution. I have tried searching online for methods and consulting with colleagues and seniors, but none of them have a good solution. We can only rely on students' self-awareness. If students want to learn well, they will learn well. If they don't want to, even if the teacher tries hard, the effect will not be good. I feel somewhat ashamed about this because I cannot guarantee the teaching and learning effectiveness of students.

Host: Many people are actually confused about the monitoring issue.

T5: Indeed, we do not have effective monitoring methods. Each student is in a different environment, and some come from families with average living conditions or in mountainous areas with poor network signals, often dropping off during class. Some students even have to walk several miles of mountain roads to find places with internet access. All kinds of situations exist, and we cannot guarantee the effectiveness of each person's teaching. Unable to treat everyone equally and achieve the expected results.

Host: When you first started using online classrooms, which online platform did you think was most helpful for English teaching?

T5: Our school mainly uses Tencent Meeting, and some teachers also use Study Pass. I think Study Pass is very good, it is currently the most powerful learning platform. Rain Classroom is also good, but I still prefer Study Pass.

Host: Where do you think is the best place for Study Pass?

T5: It can effectively record students' learning progress and provide feedback reports. It is relatively intelligent and can meet the needs of teachers, which is rare. The two platforms I use the most are Tencent Meeting and Study Pass, and I believe personalized services are key. The platform's ability to consider details is something I greatly appreciate.

Host: Have you encountered any technical issues when using online teaching platforms? How was it resolved?

T5: We will definitely encounter it. Taking Tencent Meeting as an example, everything was normal when the epidemic first occurred. At that time, dozens of students in the class could turn on their cameras simultaneously. But later on, the situation changed and it was no longer supported for the whole class to turn on the camera at the same time, which became the biggest problem. Although the use of a camera is limited, it can at least serve as a temporary monitoring function. Later on, it was not allowed for so many students to turn on their cameras at the same time, and only members could be purchased. This is a big problem.

T5: Additionally, there may be network latency issues during class. This problem cannot be solved. I remember one time when the internet was not good because everyone could attend classes online and couldn't guarantee smooth internet connection. I can only contact students, inform them of the situation in the group, and ask them to do preview or review.

There are many such problems. You can either purchase membership to solve the problem or wait for the network to become smooth, which are basically the only two methods.

Host: How do you view the role of teachers in online learning? Has there been any change compared to traditional classrooms?

T5: There will be changes. In the Chinese environment, teachers usually play a leading role, both offline and online. In offline classrooms, teachers can appropriately delegate power to students because their performance can be seen, and other students can also see it. However, in online teaching, this kind of delegation behaviour is not common because we do not know what results will be obtained after delegation, nor are we sure if students can bear it. Therefore, compared to offline teaching, online teaching may be more restrained and tend to be more conservative in delegating power to teachers and students, as this is related to teaching effectiveness. This is my biggest feeling.

Host: So, do you think you can adapt quickly and well to this role transition?

T5: Slowly, it seems that I have also accepted this approach. Although the teaching effect may not be as expected, the time may be more abundant because we do not need to take the bus to work and students do not have to wake up early, so their energy will be more abundant. Due to not being able to see the students' expressions, I sometimes assign some homework and ask them to give me feedback after completing it. This is not very common in traditional classrooms, but in online classes, I can set aside time for students to complete their assignments. This can provide timely feedback and is one aspect of improving teaching. As for whether the role transition can be quickly adapted, I think it's okay. For me, I gradually adapted after a few weeks.

Host: In terms of teaching effectiveness, which do you think is better between traditional face-to-face classroom teaching and online teaching?

T5: In terms of effectiveness, traditional face-to-face teaching is undoubtedly superior to online teaching. Both students and teachers generally believe that face-to-face communication is more effective because it is more direct and warmer. In online teaching, everyone is facing the computer screen, lacking real communication between people. In addition, some students may be more easily distracted, which makes the effectiveness of online teaching difficult to compare with offline teaching. Therefore, I personally believe that offline teaching is always better than online teaching.

Host: Do you think the interaction between offline classrooms and students will be stronger?

T5: Yes, the interaction will be stronger.

Host: Although online interaction may be weak, it is still necessary to maintain interaction with students. How do you interact with students in online classrooms?

T5: In online classes, I will arrange some group tasks where each student has the opportunity to answer questions. After the group discussion, there is usually a representative who reports the results. However, online, such group activities cannot be conducted and can only be turned into individual tasks, where students need to think and answer questions on their own. In each class, I will call out at least 30 to 40 students in the class to answer questions, and have other students share their answers on the public screen or have a student answer specific question. This can remind students to stay focused because I will use the software's random roll call function, and students cannot predict who I will call. In this way, it helps to reduce students' distraction.

Host: How do you evaluate the interaction in online classrooms? What is the quality of these interactions?

T5: The quality of interaction in online classrooms is usually not particularly high. As I mentioned before, face-to-face communication between people is difficult to replace. In online courses, due to time and scene limitations, we are unable to fully grasp the students' situation. I will ask each student to answer questions, but in reality, only half of the students can answer accurately, and other students often find various reasons, such as network latency or not hearing the questions. This makes it difficult for us to determine whether students are paying attention or if there are really problems with the internet, which can be very frustrating.

Host: How do you design your online courses?

T5: When designing online courses, I will use exercises on the public screen instead of offline group activities. For example, I would suggest translation techniques, and students would type their translated answers onto the public screen after learning. Everyone can see each student's translation and discuss its advantages and disadvantages to help everyone improve. This can enhance students' interest in learning and strengthen their sense of participation through personalized exercises.

Host: Can you integrate multimedia elements such as images, videos, and audio to enhance interactivity?

T5: I usually don't use audio and video very much because I'm worried that students may get lost and the effect may not be ideal. For example, students in our school find it difficult to access original audio and video in class. In online classrooms, without the guidance of teachers, students may find it difficult to understand the content. Therefore, I usually avoid using these extension materials in class. However, if it is for practical exercises such as the CET-4 and CET-6 exams, I will use relevant audio and video materials, but with weaker entertainment value and more emphasis on practicality.

Host: How do you evaluate students' learning performance in online classrooms?

T5: This mainly depends on the individual situation of the student. Overall, students who perform well perform well both online and offline, while those who perform poorly are not ideal both online and offline. The most difficult to deal with are students with average performance, who may work hard under teacher supervision but tend to relax during online classes. The management of these students is the most challenging.

Host: During the epidemic, were final exams conducted online?

T5: Yes, the final exam was conducted online.

Host: Is there any difference between it and a regular exam?

T5: Regular exams are conducted in the classroom, and everyone goes offline for the exam. During the epidemic, exams were conducted at students' homes using personal computers or mobile phones. The main difference lies in the exam location and equipment; there is not much difference in other aspects.

Host: Has there been any change in the final grade of online teaching compared to the previous final grade of the same teaching content?

T5: Overall, the results of online teaching are similar to those of offline teaching. However, the grades of online teaching may be slightly lower. The effectiveness of online courses is often not as good as face-to-face courses because students are at home and lack the collective learning atmosphere of school environments. In school, everyone encourages each other, but at home, this promoting effect is greatly reduced. Therefore, the results of offline teaching are usually better, that's my impression.

Host: How do you ensure that students stay motivated and focused in online English

classes? Is there any way to make them focus on the classroom?

T5: It is very difficult to ensure that students are fully focused. I think we can only guarantee that about 20% of the students in the class can continue to invest. The remaining students often find it difficult to maintain focus. Students who perform well can be referred to as "good students" in the traditional sense, while other students are not very cooperative. In fact, it is difficult to find effective ways to encourage all students to actively participate.

Host: Would you try some methods to attract students' attention?

T5: I will motivate students through grades. If students actively answer questions on the public screen in class, I will show it in my grades. If students do nothing in class, their grades will naturally be affected. Usually, after explaining these, some students will actively participate. But there are still some students who feel indifferent and believe that they can pass even if they don't do it. No matter what method is adopted, it may be effective for some students, but it cannot have an impact on the majority of students.

Host: Do you think teachers still need to be proficient in using online teaching software such as Tencent Meeting, DingDing, Enterprise WeChat, etc. after the end of the epidemic?

T5: Yes, I think it's still necessary for contingency. The future situation is difficult to predict, and if teachers travel or urgently need online tutoring, the software can play an important role. Therefore, mastering these online teaching tools proficiently is an important skill. Although the epidemic has brought many challenges, it has also enabled us to proficiently master various teaching applications, which is a great gain.

Host: What do you think are the main factors that affect the effectiveness of students' online learning?

T5: I think the main factor is the overall learning attitude of students. Of course, students cannot be solely blamed, as curriculum design, textbooks, teaching content, and teachers' attitudes can all affect learning outcomes. I think the most prominent reason is the coordination between teachers and students. Lack of cooperation may be due to students' lack of motivation or teachers' lack of enthusiasm. How to achieve good cooperation between teachers and students is a question worth considering.

Host: Do you have anything else to share? It could be about online College English teaching.

T5: I don't have any specific content to share. However, whether it is online or offline

teaching, the goal of teachers is for students. Good students usually know that they need to learn something, otherwise their college time will be wasted. But the temptation and interference from the outside world are very strong. How to resist these temptations, or how to make teaching more interesting, is a key issue. I remember a student mentioned before those foreign classrooms can sometimes be like games, both fun and informative. I have been thinking about how to integrate entertainment and teaching into our English teaching, so that students can complete their studies in a pleasant atmosphere. Although my current abilities may not be sufficient to achieve this goal, it is the direction I have been striving to explore.

Host: Okay. Thank you very much, Ms. Li, for taking the time to interview.

Appendix I The RTA Coding Process

I.1 Initial Codes

I.1.1 Initial Codes from Student Respondents

No.	Sub-category	No.	Sub-category	No.	Sub-category
1	Pandemic experience	16	Keeping attention	31	Challenges and setbacks
2	Adaptation	17	Cognition development	32	Autonomy and control
3	Institution support	18	Resource utilization	33	Self-directed learning
4	Personal views	19	Self-management	34	Personal goals
5	Distraction in online class	20	Learning plans	35	Physical space
6	Negative Emotions	21	Improvement ability	36	Insufficiency of online learning environment
7	Benefits from online class	22	Positive performance	37	User-friendliness
8	Satisfaction with online class	23	Non-accomplishment	38	Assessment
9	Limitations of online class	24	Commitment	39	Post-pandemic influence
10	Teachers' guidance	25	Skilfulness	40	Human environment
11	Teachers' impact	26	Intuitiveness	41	Peer interaction
12	Teacher's support	27	Confidence to manage	42	Supervision ways
13	Personal growth	28	Self-discipline	43	Platforms and tools
14	Academic development	29	Learning Strategy	44	Rich online resources
15	Future expectation	30	Adjustment	45	Convenient learning tools

I.1.2 Initial Codes from Teacher Respondents

No.	Sub-category	No.	Sub-category	No.	Sub-category
1	Not fully prepared	9	Preferred Contents	17	Involvement
2	Teaching platform options	10	Interaction Ways	18	Inactivity to watch students
3	Application adaptation	11	Teachers' efforts	19	Encouragement
4	Changes of teachers' roles	12	Positive Effects	20	Resourcefulness
5	Screened teaching difficulties	13	Negative Effects	21	Application challenges
6	Online Teaching Strengths	14	Final Examination	22	Ways to monitor
7	Online Teaching Limitations	15	Periodical Assessment	23	Willingness
8	Incorporate Elements	16	Task-driven	24	Skilfulness

The software Nvivo 14 was used to support the phases.

I.2 Themes Searched

I.2.1 Themes Searched from Student Respondents

Category	Coding	Reflexive interpretation
Transition Experience	Pandemic experience	The transitional experience during a pandemic involves a complex interplay of adapting to new realities, seeking and receiving institutional support, and navigating personal adjustments and perspectives.
	Adaptation	
	Institution support	
	Personal views	
Emotion Experienced	Distraction in online class	Student emotion experienced in the pandemic period deals with both the strategies used to manage emotional experiences (coping mechanisms and distraction) and the nature of the emotions themselves (negative emotions), highlighting how individuals interact with and respond to their emotional states.
	Negative Emotions	
Learning Experience	Benefits from online class	It is about a balance of positive outcomes (benefits), personal fulfilment (satisfaction), and challenges or obstacles (limitations). Understanding these aspects provides a comprehensive view of how learning experiences impact individuals and highlights the areas where they can grow or face difficulties.
	Satisfaction with online class	
	Limitations of online class	
Teachers' Influence	Teachers' Guidance	Teacher influence encompasses the guidance teachers provide in structuring and directing learning (teacher guidance), the broader effects they have on students' overall development and attitudes (teacher impact), and the support they offer in helping students overcome obstacles and achieve their potential (teacher support). Each aspect highlights a different facet of how teachers shape and enhance the educational experience.
	Teachers' Impact	
	Teachers' Support	
Self-drive	Personal growth	Self-drive is integral to personal growth by fostering self-improvement, to academic development through motivation and persistence in learning, and to future expectations by guiding individuals toward achieving long-term goals and aspirations. Each dimension highlights how self-drive influences various aspects of an individual's journey toward achieving success and fulfilment.
	Academic development	
	Future expectation	
Learning Efficiency	Keeping attention	Learning efficiency is concerned with student's interest making the learning process engaging and motivating for students. Students need to enhance their ability of how effectively and quickly learners process and understand information. Being able to use time, materials, and tools, they may efficiently achieve optimal learning outcomes.
	Cognition development	
	Resource utilization	
Time Management	Self-management	Each of these aspects contributes to effective management by enhancing personal discipline, strategic learning, and a commitment to continuous improvement.
	Learning plans	
	Improvement ability	
Task Completion	Positive Performance	There is a close relationship between task completion, positive performance, non-achievement, and commitment. Positive performance serves as a crucial safeguard for the successful completion of tasks; non-achievement, on the other hand, has a negative impact on task completion. Commitment, meanwhile, acts as a vital motivator that drives task completion forward. Consequently, students should strive for positive performance, avoid non-achievement, and uphold our commitments steadfastly.
	Non-accomplishment	
	Commitment	
Navigating Learning Tools	Skillfulness	Skills, intuitiveness, and confidence are interconnected and mutually reinforcing.
	Intuitiveness	
	Confidence to manage	
Pace Regulation	Self-discipline	Each aspect contributes to a balanced and effective learning experience by ensuring that the pace of learning aligns with both personal and educational needs.
	Learning strategy	
	Adjustment	

Category	Coding	Reflexive interpretation
Learning Challenges and Autonomy	Challenges and setbacks	When learners encounter challenges and setbacks, their level of autonomy and control can significantly influence how they respond. Autonomy empowers learners to navigate and address challenges effectively, while control allows them to adjust their approach in response to setbacks, ultimately leading to a more resilient and adaptive learning experience.
	Autonomy and control	
Goal Setting and Progress Tracking	Self-directed learning	Goal setting and progress tracking are essential components of self-directed learning. They provide learners with a roadmap to success, allowing them to stay focused, motivated, and able to adapt their learning strategies as needed to achieve their personal goals.
	Personal goals	
Physical Environment	Physical Space	Physical environment helps create environments that support productivity, comfort, and safety, ultimately enhancing overall learning effectiveness and experience.
	Insufficiency of online learning environment	
	User-friendliness	
	Assessment	
	Post-pandemic Influence	
Human Factors	Human Environment	The design and layout social environments impact user experiences and managerial effectiveness. Social environment can be optimized to support better interaction, efficient supervision, and overall improved functioning.
	Peer interaction	
	Supervision ways	
Learning Tools	Platforms and tools	Learning tools offer accessibility, flexibility, and personalization, allowing learners to engage with educational content in ways that suit their individual needs and preferences.

I.2.2 Themes Searched from Teacher Respondents

Categorization	Coding	Reflexive Interpretation
Adjustment	Not fully prepared	The pandemic forced College English teachers to make substantial adjustments in preparation, teaching platform, and technology to ensure the continuity of education and provide a quality learning experience for their students.
	Teaching platform options	
	Application adaptation	
Teacher's role	Changes of teachers' roles	Teachers had to change their roles because of sudden change of teaching mode and virtual teaching. They of course met lots of difficulties in managing student learning engagement.
	Screened teaching difficulty	
Teaching form	Online teaching strengths	The teaching changed from face to face to online classrooms, which leads to the change of teaching form, Flexibility, accessibility and technology-enhanced learning are needed as well.
	Online teaching limitations	
Diversification	Incorporation elements	Diversification is needed in online teaching. Teacher incorporated visual, audio and multimedia elements in their teaching and try select some materials that students preferred.
	Preferred contents	
Influence	Positive effects	Students gradually accepted the online teaching and benefit from it, although online teaching is not perfect or sometimes unsatisfactory.
	Negative effects	
Interaction	Interaction ways	It is difficult to interact with students in online teaching, but teachers tried different form to keep on the interaction. According to the teachers' views, the interaction worked more or less.
	Teachers' efforts	
Evaluation	Periodical assessment	There are different ways to implement periodical assessment, such as assignments, note-taking, questions. Due to the psychological pressure, the difficulty of final exam decreased.
	Final examination	
Maintaining motivation and focus	Encouragement	Students' motivation and focus are maintained through teachers' positive encouragement and tasks, which leads to students' active involvement in College English learning.
	Involvement	
	Task-driven	
Mastery of software	Skilfulness	Online teaching needs teachers to operate the software and platforms skilfully. The skilful operation makes teachers willing to practise teaching, discussion, tasks and examinations in online College English course.
	Willingness	
Monitor	Inactivity to watch students	It is very important to monitor students to have online College English, but hard to deal with students through computer screen. Teachers try to monitor students by inventing new ways and sharing good experiences.
	Ways to monitor	
Platform and tools	Resourcefulness	Platforms and tools offer abundant teaching information and materials, but there are also technical problems and emergency situations.

I.3 Potential Themes Reviewed

I.3.1 Potential Themes Reviewed from Student Respondents

Core Categorization	Categorization	Coding
Attitude	Transition experience	Pandemic experience, adaptation, Institution support, Personal views
	Emotion experienced	Distraction in online class, Negative Emotions
	Learning experience	Benefits, Satisfaction, Limitations
Motivation	Teachers' influence	Teachers' guidance, Teachers' impact, Teachers' support
	Self-drive	Personal growth, Academic development, Future expectation
	Learning efficiency	Keeping attention, Cognition development, Resource utilization
Self-efficacy	Time Management	Self-management, Learning plans, Improvement ability
	Task Completion	Positive Performance, Non-accomplishment, Commitment
	Navigating Learning Tools	Skilfulness, Intuitiveness, Confidence to manage
Self-regulation	Pace Regulation	Self-discipline, Learning strategy, Adjustment
	Learning Challenges and Autonomy	Challenges and setbacks, Autonomy and control
	Goal Setting and Progress Tracking	Self-directed learning, Personal goals
Environmental Impact	Physical Environment	Physical Space, Insufficiency of online learning environment, User-friendliness, Assessment, Post-pandemic Influence
	Human Factors	Human Environment, Peer interaction, Supervision ways
	Learning Tools	Platforms and tools, Online resources, Convenient learning tools

I.3.2 Potential Themes Reviewed from Teacher Respondents

Core Categorization	Categorization	Coding
Attitude	Adjustment	Not fully prepared, Teaching platform options, Application adaptation
	Teacher's role	Changes of teachers' roles, Screened teaching difficulty
	Teaching form	Online teaching strengths, Online teaching limitations
Behaviour	Diversification	Incorporate elements, Preferred contents
	Influence	Positive effects, Negative effects
	Interaction	Interaction ways, Teachers' efforts
Management	Evaluation	Periodical assessment, Final examination
	Maintaining motivation and focus	Encouragement, Involvement, Task-driven
Technology	Mastery of software	Skilfulness, Willingness
	Monitor	Inactivity to watch students, Ways to monitor
	Platform and tools	Resourcefulness, Application challenges