

Online Learning Engagement and Gains Among International Students in China

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Abstract: This study utilized learning engagement, learning participation and constructivism theories in analyzing the online learning engagement of international students in China. Drawing on the more comprehensive CCSS questionnaire developed by scholars on the basis of NSSE-CHINA, this study collected data on the online learning engagement among international students in China and their learning gains through online questionnaires. The researcher integrated the data through using descriptive statistics. The empirical results of this study show that most of the international Chinese students agree on their online learning engagement with behavior as the highest, followed by social, cognitive and emotional as the lowest; majority of the respondents agree on their learning gains with attitude learning as the highest, followed by knowledge and skills; that there is highly significant relationship between online learning engagement of students and their learning gains; meaning, when the behavior, social, cognitive and emotional learning engagement of the students are high or positive, their attitude, knowledge and skills are also positively influenced. As a result of the study, the researcher proposed an action plan for the students' online learning engagement enhancement.

Keywords: Online learning engagement, Learning gains, International Students.

1. Introduction

The modernization of educational technology has led to the growth of online education, e-learning, and the integration of information and communication technologies (ICT) into teaching and learning at all levels. Online education offers advantages such as simplicity, convenience, speed, and the ability to remove geographical and physical constraints. China's higher education sector has shifted from serving its political and diplomatic mission to serving the country's modernization, facilitating student exchanges, and training talent. The slogan "Study in China" was introduced in June 2020 to further strengthen international cooperation in higher education. However, there is an urgent need to improve the quality of international student education and promote a quality-centered internal development. International students come to China for self-fulfillment, and the quality of their online learning is crucial. Educators are concerned about how universities can overcome unfavorable factors such as online learning environment, investment, implementation teaching, online learning experience, and satisfaction to keep pace with the internationalization of online education and improve the level of online education for international students in China. Rogaten et al. (2018) explored learning gains, revealing a variety of methodologies for measuring affective, behavioral, and cognitive (ABC) gains. However, there's a lack of consistency in measuring these gains, hindering effective comparisons. This study aims to understand the connection between learning engagement and gains, focusing on factors influencing online engagement and academic progress for international students in China.

2. Literature Review

2.1. Online learning of students

Online learning, also known as Distance Learning or E-learning, is a digital pedagogy that uses visual graphics, text, animations, videos, and audio to facilitate group learning and

instructor assistance. This study focuses on international Chinese students who use online learning as an alternative to traditional classroom settings. Online learning platforms offer a dynamic, accessible gateway to education, empowering students to explore their passions, develop critical thinking skills, and foster global collaboration and personalized learning experiences. Learner engagement is crucial for high-quality online education, involving mental and physical effort spent in the learning process. The amount of time spent in online learning significantly impacts learning outcomes. Cherkasky et al. (2016) proposed an instructional design framework and strategies to promote learner engagement in online learning (ELED). Paul et al. (2018) used the Indicators of Engaged Learning Online (IELO) framework to assess online course quality, focusing on teacher teaching and student learning behaviors. Halverson and Graham's Online Engagement Framework for Higher Education focuses on online learning engagement, but only includes one indicator specific to online learning. The current distance online learning environment suffers from a lack of humanistic, low-quality off-campus, and regional differences. The quality of the learning environment needs to be optimized jointly by institutions and society. Zhang Tao et al.'s (2018) study highlights the importance of student engagement in online education, showing a positive relationship between the online learning environment and academic performance. Educators should invest resources in developing attractive online education content, platforms, and infrastructure. Online student engagement is primarily driven by interaction and collaboration between students and teachers. Teachers can enhance student success by incorporating purposeful course design, such as teacher-student interaction. Online interaction is a crucial part of the educational experience, involving course content, peers, instructors, and technological mediums. Online students typically interact for knowledge sharing and building, with some still preferring traditional face-to-face learning. However, other components of face-to-face interactions provide opportunities for socializing and peer

interaction. Dixon's (2016) study found that online course interaction significantly impacts student engagement, as motivation and physical connection are crucial. Distance learners rely on interactions with teachers or peers to feel connected. However, high-quality online courses are more costly to develop and administer than face-to-face ones. High-quality teaching and learning enhance student engagement through socioemotional, learning behavior, and cognitive means. Social presence is central to the effectiveness of online teaching and learning. Instructional engagement significantly impacts online learning performance, with factors such as teacher engagement, instructional design, student-teacher relationships, and interactions influencing student engagement, learning achievement, and satisfaction. Student factors like perceptions of instructional engagement, motivation, self-directed learning ability, and self-efficacy also play a role. Learning engagement is an essential evaluation index for evaluating higher education quality. Research on learning engagement has been more mature and systematic, with domestic scholars' research starting from the NSSE in 2000. University students' learning engagement is crucial for achieving learning gains, and the quality of higher education is closely related to these factors. Su Linqin (2020) found that learning engagement significantly influences learning gain in engineering college students, with behavioral, cognitive, and emotional engagement having a positive impact. Li and Qin (2019) found that external inputs, emotional support, and teacher-student interaction had a positive impact on learning gains. Student engagement is a multidimensional concept, influenced by factors such as interest, attachment to school, achievement motivation, self-regulated learning, and commitment to learning. Early engagement is associated with course performance and self-report measures, while later engagement patterns are less relevant. Factors influencing college students' learning engagement include demographic variables, socioeconomic status, and self-efficacy. Teacher-student and peer interaction factors have a significant impact on students' behavioral and affective engagement, while individual factors are key. Yuan (2020) found that external environmental factors, such as parenting style and peer relationships, and internal individual factors like autonomous motivation and self-efficacy can influence learning engagement. Wang Yashang (2013) found that peer interaction has high explanatory power for learning gains. Improving students' learning behavioral engagement is crucial for improving learning performance and enhancing education quality. Online learning engagement varies across different learning environments, with smart classrooms resulting in better behavioral, cognitive, and emotional learning. External factors like online resources and learning support services also impact students' engagement. Active and collaborative learning and students' learning experience also impact engagement. Online learning engagement influences the quality of students' online learning and teachers' online teaching. Factors such as perceived teacher support, online learning platform experience, self-efficacy, satisfaction, and attitude also influence engagement. Information literacy influences active learning strategies and indirectly influences online learning performance. Web-based learning self-efficacy contributes to different types of engagement, with general self-efficacy contributing to behavioral and affective engagement and functional self-efficacy contributing to affective and cognitive engagement. A positive psychological state and psychological capital

significantly predict burnout and engagement in online learning. Zhan-Ying's study found that formative assessment FEA significantly impacts students' course engagement in cognitive, affective, and behavioral aspects. Yang Gang and Dai Zhaohui's study explored students' online English learning engagement in various dimensions, finding that teaching interaction significantly affects engagement. Wang Siyao's study found that students' engagement in online learning positively impacts student-student, student-teacher, and content interaction. However, research on international students' online learning behavior in China is insufficient, with few studies using large samples of questionnaires or qualitative research methods. Therefore, the study of international students' online learning engagement has significant relevance.

2.2. Student Learning Gains

Learning gain, a concept originating from psychology, is defined by various scholars as the knowledge, ability, and ability acquired by students after completing education or a series of learning experiences. It encompasses knowledge, skills, attitudes, emotions, and abilities acquired through learning activities. Some scholars believe that learning gain is the personal transformation and growth of students as a result of higher education. It encompasses overall quality and comprehensive ability performance. This literature review explores learning gains in China, focusing on the development of students' cognition, ability, affective values, and cognitive abilities during learning. Accurate measurement of learning gains is crucial, with various assessment tools like pre-tests and post-tests being commonly used. Alternative methods like concept maps and student self-reflection are explored. A distance education monitoring mechanism with learning inputs at its core can improve the quality of modern distance education. Factors influencing learning gains include instructional design, such as spaced repetition and formative assessment, and active learning strategies like problem-solving and collaborative learning. Technology can enhance learning gains, as studies show. Factors such as student characteristics, prior knowledge, learning styles, and motivation also influence learning outcomes. Effective instruction considers these factors and provides differentiated experiences. Research on learning gains informs pedagogical practices, allowing educators to design more effective instructional approaches. The National Survey of Student Engagement (NSSE) in the U.S. measures learning engagement by measuring students' commitment to effective learning activities and the quality of teaching and learning. The NSSE's measurement tools, such as the College Student Report, assess the quality of teaching and learning in universities. The National Student Survey (NSSE) is a tool developed by the higher education community in the U.S. It evaluates the quality of undergraduate education at U.S. universities and serves as a reference guide for university selection. The NSSE survey is used in developed countries like the U.S. and Canada, and is crucial for international comparison. Studies have shown that online engagement with Moodle and the development of online learning resources significantly impact student learning outcomes. In China, a case study found that gender, grade, and high school type significantly influenced students' quality of effort in college activities and learning gains. Gamification positively affects students' competence, autonomy, and relatedness, with students in gamified online classes showing more competence

in learning and critical thinking.

3. Research Method

The researcher utilized a descriptive method to analyze the relationship between online learning engagement and the learning gains of international Chinese students. Descriptive research involves describing events and developing future plans based on these observations. Quantitative analysis techniques like graphs, charts, and statistics help researchers examine relationships and trends within their data. A survey of 315 international students in China, including undergraduates, master's, doctoral, non-academic Chinese language, and foreign exchange students, investigated the impact of the COVID-19 pandemic on their online learning engagement. The study used an online questionnaire to gather empirical data on the situation in China and abroad. The study aimed to investigate international students' engagement in online learning using a questionnaire survey. The survey included two parts: Online Learning Engagement of Chinese International Students and a Clinical Teaching Quality Questionnaire. The data was categorized into knowledge, skills, and attitude domains. The questionnaires were translated into Chinese and tested for reliability and validity using Cronbach's alpha. The results showed high reliability and good quality of the questionnaire, indicating its usefulness in the study. This study used an online questionnaire to collect data on online learning engagement and gains among international students stranded abroad due to epidemic prevention. The study involved 273 questionnaires distributed to school head administrations, with a recovery rate of 92.7%. The data was analyzed using statistical tools like weighted mean, Pearson Product Moment Correlation, and SPSS version 23. Correlation analysis was used to explore responses categorized by sex, educational attainment, and major. The research was approved by the Ethics Review Committee from Lyceum of the Philippines University – Batangas and subject university administrations. The study adhered to principles of informed consent, confidentiality, and voluntary involvement, with participants informed of potential risks and benefits.

4. Results and Discussion

4.1. Percentage Distribution of the Respondents Profile

The study examines the profile distribution of international students in China, focusing on first-class universities and disciplines. Male students make up 73.7 percent of the sample, while female students make up 26.3%. Societal norms in China may influence educational choices, with males being more likely to pursue higher education. The majority of international students are undergraduates, with master's degree holders accounting for 32.4% and doctorate degree holders accounting for 18.4%. China has become the largest destination country in Asia and the center of postgraduate education in the Asia-Pacific region, with the development of study abroad education promoting internationalization and becoming a world power in higher education.

4.2. Online Learning Engagement of International Students in terms of Behavioral

The study evaluates online learning engagement, focusing

on behavioral aspects. The highest mean score was 3.57 for attending every online course on time, indicating a strong endorsement. Online learning offers asynchronous options like pre-recorded lectures and discussion forums, allowing flexibility for learners with busy schedules or different learning styles. Students in gamified online classes show more competence in learning and mastering new skills. The ability to take meticulous notes and dedicate extra time to learning and practicing speaking Chinese received positive assessments. Gary et al. (2015) found that online engagement with online learning and the development of resources and learning methods significantly associated with student learning outcomes. However, the items concentrating on learning without giving up, utilizing online course resources for Chinese learning, and achieving high-quality results received lower ratings.

4.3. Online Learning Engagement in terms of Cognitive

The study evaluates the cognitive aspects of online learning engagement among international students in China. The cognitive input includes seven indicators, including making study plans, summarizing course content, adopting learning strategies, and reflecting on performance. The highest scores are shared by three indicators: using appropriate memory methods, organizing knowledge, adjusting learning strategies, and reflecting on performance. The secondary indicators of planning, monitoring, and regulating strategy show that international students are more capable of regulating themselves in time, but their reflections on online learning are average or insufficient. This dynamic approach keeps students engaged, fostering deeper understanding, critical thinking, and cross-cultural collaboration. The score of knowledge transfer and construction indicates that international students are more capable of linking new and old knowledge to help them understand their online course.

4.4. Online Learning Engagement in terms of Emotional

The study evaluates the emotional aspects of online learning engagement among international students in China. The results show a composite mean of 3.39, indicating a general agreement among respondents. Emotional engagement in online learning includes pleasure, curiosity, sense of belonging, self-efficacy, participation, curiosity about content, resources, and teaching methods, belief in ability, and feeling valued by peers. The highest mean score for sense of belonging is 3.48, indicating that online learning did not affect students' choices to continue studying in China. External factors such as online resources and learning support services also influence engagement. The pleasure generated by online learning is higher than the medium-intensity observation value, and the self-efficacy scores are above the medium-intensity observation value. The amount of time spent in online learning significantly impacts learning outcomes.

4.5. Online Learning Engagement in terms of Social

The study evaluates online learning engagement among international students in China, focusing on social aspects. The results show a strong overall agreement, with a composite mean of 3.58. Social engagement includes teacher-student interaction, collaborative learning, and communication with

classmates. The mean scores are above the medium intensity observation value, indicating relatively high online learning affective engagement. Collaborative learning and experience sharing are the top two, indicating students can share resources and experiences, and believe they can complete courses online. The study also highlights the importance of quality content in facilitating learning in social contexts. Teacher-student interaction is the lowest, with a mean score of 3.47, suggesting students can actively answer teacher questions and interact with teachers. However, some students may struggle with English fluency.

4.6. Summary Table on Online Learning Engagement of International Students

The study reveals that international students in China have a moderate online learning investment, with an overall score of 3.45, which is above the medium intensity observation value. Among the four dimensions of online learning input (behavioral, social, emotional, and cognitive), there is no significant difference in scores. However, behavioral engagement received the highest score at 3.50, indicating active participation in online learning activities. Social engagement followed closely at 3.48, suggesting some interaction with peers or instructors. Emotional engagement was slightly lower at 3.42, indicating moderate emotional involvement. Cognitive engagement was the lowest at 3.39, suggesting less engagement in intellectual aspects. Technical issues can hinder engagement.

4.7. Student Learning Gain as to Knowledge

The study reveals that online learning has significantly improved the independent learning abilities of international students in China, with a mean score of 3.45. Students who can think critically about course material are more likely to benefit from online learning. Providing supplementary materials like books and audios is crucial for distance education. Effective learning should be engaging and engaging, with emerging technologies offering various methods and tools. Students also agree that they understand course learning objectives, with a mean score of 3.46. Clear communication of learning objectives by instructors significantly contributes to students' comprehension. Clear communication also helps students feel confident in their ability to understand and achieve learning outcomes. However, students struggle with translating knowledge into actual tasks, with a mean score of 3.41. Smart classrooms create learning environments that are generally more engaging in behavioral, cognitive, and emotional terms. Overall, online learning gains in terms of skills are generally agreed upon.

4.8. Student Learning Gain as to Skills

The study reveals that international students in China are able to work effectively with others on collaborative learning tasks, demonstrating the independent learning ability of online learning. The study also shows that students are capable of reflecting on their learning experiences and identifying areas for improvement. They also demonstrate competence in applying knowledge to new situations and communicating effectively with others. Effective communication of learning is crucial in education and professional settings, as it helps develop understanding and communication skills. The lowest three indicators are able to overcome challenges and setbacks in learning, develop

strategies for learning concepts and skills, and manage time effectively. Resilience and adaptability are also important in the learning journey, as they promote academic success, persistence, and psychological well-being. The study also shows that online learning gains in attitude are higher than 2.5, with the highest score of 3.55 for overall satisfaction with the learning experience. Colleges and universities have played a significant role in promoting the effective development of online teaching methods.

4.9. Student Learning Gain as to Attitude

Students in a course are generally confident in their ability to learn the material, with a weighted mean of 3.51. This confidence is influenced by self-efficacy theory, which suggests that individuals with high self-efficacy are more likely to approach tasks with confidence, effort, and persistence, leading to better performance outcomes. Research has consistently shown a positive relationship between self-efficacy beliefs and academic achievement. Social cognitive theory suggests that self-efficacy beliefs are influenced by mastery experiences, vicarious experiences, social persuasion, and physiological and affective states. Motivation to learn is a crucial aspect of one's attitude when attending class or learning on oneself. Engaging students in active learning activities, such as problem-solving, collaborative learning, and student-centered discussions, has been shown to increase learning gains.

4.10. Summary Table on Student Learning Gains

The study reveals that international students in China have successfully adapted to online learning, recognizing it as a valuable alternative for continuing their education. The virtual environment promotes knowledge acquisition, self-learning skills, a positive learning mindset, and a strong emotional connection to the material. To improve students' learning gains, colleges and universities need to stimulate motivation, strengthen teaching and learning environments, and establish a new concept of quality in higher education. The results show significant differences in emotional and social responses among students based on their educational background, with those with undergraduate degrees showing better assessment.

4.11. Difference of Responses on Online Learning Engagement of International Students when Grouped according to Profile

International students' responses to online learning engagement, based on their educational background, highlight the importance of emotional and social interactions. Chinese students are satisfied with group discussions and believe they can complete online courses efficiently. They are willing to study in China and recommend it to others. They are satisfied with the software and hardware services provided by schools, society, and families, but need to strengthen peer interaction due to boredom.

4.12. Difference of Responses on Student Learning Gain when grouped according to Profile

The study reveals significant differences in knowledge and skills learning among international students based on their

educational background. Those with undergraduate degrees had better assessments. The study highlights the importance of cognitive and skills acquisition in online learning. Chinese students excelled in collaborative learning tasks. However, most students believe distance learning is insufficient for acquiring professional skills. Despite this, they are satisfied with the software and hardware services provided by schools, society, and families for online learning. However, they need to strengthen peer interaction due to boredom.

4.13. Relationship between Online Learning Engagement and Student Learning Gain of International Students

The study reveals a strong correlation between international students' engagement in online learning and their learning outcomes. The study found that increased

online learning engagement leads to greater student learning gains. The four dimensions of learning motivation, including need for knowledge, social orientation, group pressure, and need for knowledge and fame, were positively correlated. Students who were highly motivated to learn were more active and physically engaged in learning activities. The study also highlighted the importance of autonomous and interactive engagement in college student learning, which involves learning outside the classroom, participating in practical activities, and engaging with teachers and peers.

4.14. Proposed Action Plan to Enhance the Online Learning Engagement and Learning Gains of the International Chinese Students

Key Result Area	Strategies/ Activities	Success Indicators	Person/s Responsible
I. Online Learning Engagement -Emotional -feeling bored and negative about online learning Objective: to improve student emotional online learning engagement	1. Build Supportive Environment -welcome and introduce yourself, promote open communication, celebrate success and introduce student peer support 2. Enhance content Delivery innovate video lectures and interactive activities, personalize student experiences 3. Active learning and Assessment -interactive feedback, peer review and collaboration	90 % of international Chinese students are not bored and feeling positive about their online learning	Teachers Students
II. Learning Gains 2.1. Skills -time management Objective: to manage time effectively 2.2. Knowledge -identifying key concepts and skills needed to learn in a course Objective: to develop a method for identifying key concepts and skills in a course	1. Setting goals and objectives -define learning goals, create a master schedule, prioritize tasks and estimate time commitment 2. Building habits and Routines -establish a dedicated study space, set study regular hours, use time management techniques, and minimize distractions 1. Analyze the course with multiple perspectives Gather Materials: Collect the syllabus, learning objectives, textbooks, assignments, and any other relevant course materials. Lecture discussion: Assemble a group with different perspectives on the course. This could include the instructor, a subject matter expert, an instructional designer, and the students	90 % of international Chinese students manage their time effectively 90% of the international students are able to develop a method for identifying key concepts and skills in a course	Department Chair, Teacher and Students Teacher an expert Student rep Department chair

5. Conclusions and Recommendations

The study found that international Chinese students' online learning engagement is primarily based on behavior, followed by social, cognitive, and emotional aspects. The study also found a significant relationship between students' online learning engagement and their learning gains. The researcher proposed an action plan for enhancing students' engagement,

recommending continuous student-centered curriculum, talent cultivation programs, and effective communication among students and peers. Future research could replicate the study with larger sample sizes.

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