Interventions on Student Engagement: An Action Research Study of Business English Class in Southwest Forestry University in China

Xiaokang Liu[1], and Leehsing Lu[2]
[1]Dean of the Department of English, Southwest Forestry University, Kunming, China
[2]Associate Dean, Overseas Project, Assumption University, Bangkok, Thailand
[1]E-mail: larryliu@swfu.edu.cn, ORCID ID: https://orcid.org/0000-0001-6042-1112
[2]E-mail: leelu@mail.com, ORCID ID: https://orcid.org/0000-0002-4818-1440

Abstract

Background and Aim: The exploration of innovative methodologies aimed at enhancing student engagement via collaborative group activities holds significant value and demand within the context of the global higher education landscape, characterized by large-scale expansions, particularly in China, where such endeavors are paramount. This study aimed to investigate the effects of organization development interventions (ODI) on the self-efficacy (SE), active collaborative learning (ACL), and group potency (GP), intermediated by teacher support (TS), to improve student engagement (StuE) in Southwest Forestry University in China. The objectives of this research are to ascertain the relationships among ACL, SE, GP, TS, and StuE at Southwest Forestry University, identify suitable assessment tools for these constructs, understand their current developmental levels, design and implement interventions to enhance student engagement, explore a method for improving engagement among Chinese university students, and derive approximate results through quantitative and qualitative analyses.

Materials and Methods: This research adopts a quasi-experimental design featuring a pretest-posttest framework, incorporating a mixed-methods approach for its implementation. It involved two cohorts of 76 students, constituting an experimental group and a control group, who participated in the study. Specifically, a suite of 15 tailored interventions was devised and administered to the participants in the experimental class. To gather both quantitative and qualitative data within this quasi-experimental context, a comprehensive data collection strategy was employed, encompassing questionnaires (SPSS 27), focus group interviews, and reflective reports (MAX QDA).

Results: The quantitative analysis reveals that the P-values associated with the five independent variables (IVs) within the experimental group are all less than .001, thereby satisfying the threshold of statistical significance ($p < 0.05$), suggesting marked differences post-OD interventions. Conversely, the control group's P-values, all exceeding 0.05, indicate the absence of statistically significant differences. Furthermore, the qualitative data, transcribed from focus group interviews and reflective reports, coded by three independent researchers, provides corroborative evidence, reinforcing the findings of the quantitative research.

Conclusion: The outcomes of this action research, situated within the context of Southwest Forestry University, indicate that organization development (OD) interventions hold promise in bolstering Student Engagement (StuE). Nevertheless, the mediating influence of Teacher Support (TS) did not emerge as a statistically significant factor. In light of these findings, it is advocated that future research endeavors ought to delve more profoundly into the intricacies of group leadership dynamics and the role of TS to attain a more nuanced comprehension of their potential contributions to enhancing StuE.

Keywords: Student Engagement; Self-efficacy; Active Collaborative Learning; Group Potency; Teacher Support

Introduction

Student engagement (StuE) has garnered widespread recognition as a pivotal metric for enhancing the quality and overall learning experience within higher education (Aladsani, 2022; Barkley & Major, 2020; Fredricks et al., 2004; Kahu & Nelson, 2018; Wang et al., 2022; Yılmaz & Yılmaz, 2022). A growing body of evidence underscores the profound impact that StuE exerts on learners' academic achievements and personal development, underscoring its significance in fostering successful educational outcomes (Kahu, 2013; Kuh, 2009; Yin, 2023). Meanwhile, a substantial corpus of research has focused on elucidating the influence of adequate educational investment and a supportive classroom environment on Student Engagement (StuE). Especially in the higher education environment, the degree of StuE was closely related to their academic anxiety and their sense of belonging to their universities, which could improve their academic achievements. Scholars have inherited and continued the large-scale national-level research, and

paid more attention to areas such as school climate (Bear et al., 2018), digital learning environment (Hutain & Michinov, 2022), online problem-based learning (Kristianto & Gandajaya, 2023), etc.

Over the past two decades, the higher education (HE) sector in China has undergone rapid development. Gross enrollment rate (GER) of HE in China exceeded 15% for the first time in 2002, and then maintained a high growth rate, reaching 17% in 2003, surpassing the average level of low- and middle-income countries (16.48%). This figure is estimated as 54.4%, close to the average of medium and high-income countries (57.55%) (Liu & Gou, 2023).

However, high-quality development shoulders the heavy responsibility of constructing a high-quality HE system and building a prosperous country with a well-developed HE sector, and how to achieve high-quality development of HE has become an important proposition facing the reform and development of HE at present and in the future (Zheng & Ou Yang, 2022). This paper attempts to take the StuE in Kunming as an example to analyze the problems faced by the Southwest Forestry University (SWFU) and put forward research ideas on issues related to the development of StuE.

SWFU is representative in the field of HE in China for that it belongs to the provincial government and provides degree programs and is one of the 1,151 ordinary universities in China. Meanwhile, it is one of the 525 institutions with the qualification of granting master's and doctoral degrees in the country. The author surveyed 11 teaching staff from August 19th, 2022, to March 8th, 2023, on English teachers' classroom group learning. The survey results, analyzed by SWOT and SOAR, were summarized as follows: 1. In the current trend of development, educational reform is imperative, yet the effectiveness of the reform and the improvement in teaching quality have not been satisfactory. 2. Group teaching can enhance student engagement, but there are numerous issues associated with the organization of group teaching by teachers.

The problem in the current research is how to use interdisciplinary theory and practice to improve StuE in undergraduate professional courses in ordinary universities, against the background that China's HE needs to focus on improving the quality of education in the era of popularization of HE. Organizational development (OD) and organizational behavior are disciplines closely related to team activities in the field of behavior, and their theories and practical methods in organizations are rarely used in professional teaching in universities.

China's higher education has seen rapid development with increased enrollment rates, posing challenges and opportunities for quality improvement. Despite progress, educational reforms and teaching quality in undergraduate courses at universities like SWFU are unsatisfactory. This research aims to improve student engagement in Studies in English (StuE) through interdisciplinary theory and practice. It will explore relationships between collaborative learning, self-efficacy, group potency, teacher support, and student engagement at SWFU, develop measurement tools, understand current levels, design interventions, explore improvement methods, and analyze results quantitatively and qualitatively.

Given the unsatisfactory progress in educational reforms and teaching quality despite significant enrollment increases, this research aims to contribute to the field by exploring interdisciplinary methods to improve student engagement in Studies in English (StuE). By examining the relationships between collaborative learning, self-efficacy, group potency, and teacher support on student engagement, and by developing appropriate measurement tools and interventions, this paper seeks to provide practical insights and possible solutions for enhancing the educational experience of university students in China.

Objectives of Research

1. Determine the relationship between four variables - collaborative learning, self-efficacy, group potency, teacher support, and student engagement within the context of Southwest Forestry University.

2. Determine appropriate measurement tools for assessing collaborative learning, self-efficacy, group potency, teacher support, and student engagement among students enrolled at Southwest Forestry University.

3. Understand the current development level of students' collaborative learning, self-efficacy, group potency, teacher support, and student engagement.

4. Design and implement interventions to improve student engagement through collaborative learning, self-efficacy, group efficacy, and teacher support.

5. Explore a possible method that helps to improve the student engagement of university students in China.

6. Obtain an approximate result through both quantitative and qualitative analysis.

Literature review

The development of HE is inseparable from the improvement of education quality. However, research quality, not teaching quality, has been the main concern of university quality assurance and ranking indicators of universities at home and abroad (Musselin, 2018). StuE is a powerful driving force to improve the quality of HE and the foundation of educational success (Aladsani, 2022). The researcher reviews the literature on the factors related to student engagement, collaborative learning (CL).

Student engagement

StuE is an index to monitor and improve students' learning experience and learning output (Troussas et al., 2023). It is "a positive, fulfilling, work-related state of mind that is characterized by vigour, dedication and absorption" (Schaufeli et al., 2002). "Vigour is characterized by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties" (Schaufeli et al., 2002). Dedication refers to "being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge" (Schaufeli et al., 2002). Absorption is "characterised by being fully concentrated and happily engrossed in one's work, whereby time passes quickly, and one has difficulties detaching oneself from work" (Schaufeli et al., 2002).

Self-efficacy

Self-efficacy is a person's subjective judgment of their ability to complete a certain job. Self-efficacy affects learners' learning motivation and learning results. In a school learning environment, self-efficacy has an obvious influence on students' grades and the learning process itself. Bandura believes that students with a strong sense of self-efficacy will set greater learning goals for themselves and spend more time and energy on learning. It has been found that strong self-efficacy beliefs are closely related to deep learning methods, while weak self-efficacy beliefs are related to surface learning methods (Diseth, 2011).

Active collaborative learning

To improve learners' knowledge level, an interactive and active collaborative learning environment provides students with various possibilities, such as teamwork/collaboration, learning from peers, etc. (Troussas et al., 2023). Active collaborative learning is widely used in various fields, including educational places of different ages and educational settings of different disciplines. The importance of ACL in HE has been stressed from the aspect of student learning to instructors' teaching (Weinberger & Shonfeld, 2020), and even school management and teacher development (Friend & Cook, 2014).

Group potency

Group potency, considered to be one of the core components of team motivation, is a key precursor of team effectiveness and a predictive indicator of team outcomes (Gevers et al., 2020). Across the literature, whenever group potency is mentioned, the concept of collective efficacy will usually be involved. While collective efficacy is defined as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997), group potency or team potency is "generalized beliefs about the capabilities of the team across tasks and contexts (i.e., our team will be successful no matter what the task)" (Gully et al., 2002).

Teacher support

Because students spend most of their time with teachers at school, teacher support is important for students' academic development (Mercer et al., 2011), which includes not only their academic achievements, but also their emotional or emotional achievements. Study results support the notion that with time, teacher support directly and positively affects students' learning motivation and self-efficacy, which in turn has a positive impact on students' academic performance (Affuso et al., 2023).

Conceptual Framework

There is a connection between student engagement, active collaborative learning, group potency, teacher support, and self-efficacy, which has been the interest of scholars. Self-efficacy, as a kind of individual's confidence, represents whether a learner believes he or she can successfully execute tasks at school. Literature shows that self-efficacy and teacher support are positive predictors for all aspects of student engagement (Sökmen, 2021), and students' learning motivation and self-efficacy are directly and positively affected by teacher support (Affuso et al., 2023). The high-level interaction between peers and the intense interaction with teachers has a positive impact on active collaborative learning and student engagement, which in turn improves students' academic performance (Blasco-Arcas et al., 2013) and collaborative learning and student engagement affected by social factors can improve learners' learning activities in higher educational institutions (Qureshi et al., 2023). Although these associations have been presented many times in the literature, the research focusing on these five variables has been missing. Based on the previous literature, the theoretical framework proposed in this study is shown in Figure 1.

This theoretical framework draws on several theories, including group dynamics theory, student engagement theory, self-determination theory (SDT), and co-construction of learning and social interdependence theory.

The relationship between elements in the theoretical framework is not equal. Teacher support can influence self-efficiency (Jalaluddin et al., 2013), and can use self-efficiency as an intermediary variable to influence academic performance (Affuso et al., 2023) or can use teacher support as an mediator to influence other variables (Bilz et al., 2022); Group potency can affect both self-efficacy and final Performance (Monteiro & Vieira, 2016); Teacher Support can have a positive and significant impact on student engagement (Klem & Connell, 2004); Self-efficacy has a positive impact on student engagement and teacher support (teacher's assistance), which ultimately affects students' performance (Jalaluddin et al., 2013). This study draws lessons from the direct influence of group potency on perceived service quality in the business model (De Jong et al., 2005), and the relationship between team potency in the business research and the sales performance of the sales team member self-efficacy and the performance of a water purification company (Monteiro & Vieira, 2016). The increase of teacher-student interaction promotes active collaborative learning and then improves student engagement (Qureshi et al., 2021).
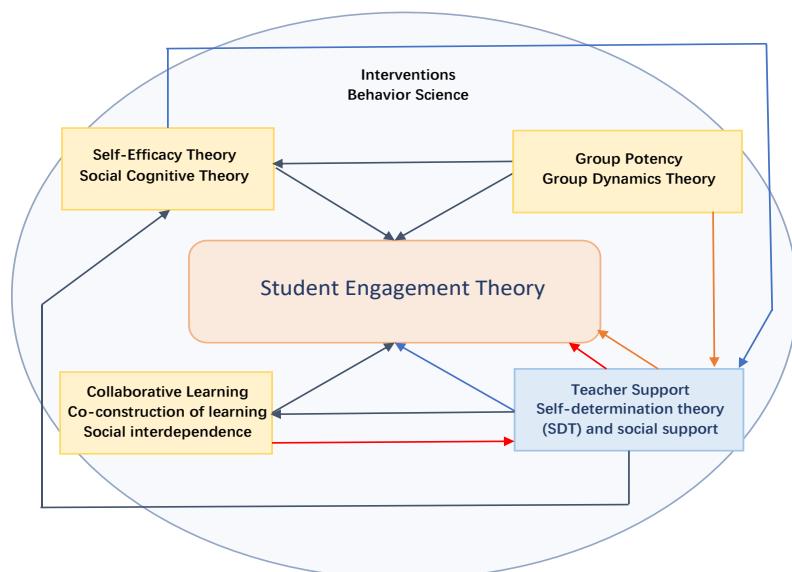
Figure 1 Theoretical Framework

This study takes the intervention measures in the OD field as the method, and takes self-efficacy, active collaborative learning, group potency as independent variables (IVs), teacher support as a mediator, and investigates the changes of student engagement, the dependent variable (DV) (Figure 2).
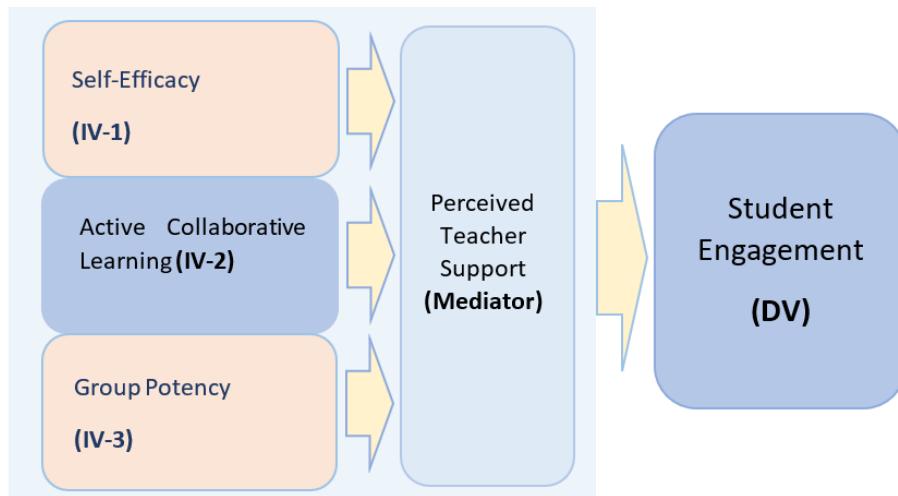
Figure 2 Conceptual Framework

Except for three IVs, one mediator, and one DV, there are cases where OD interventions and regular group activities are in parallel at the same time. This design provides a comparison for the research method of a mixed design adopted, which will be explained in detail in the third part. Among the four independent variables, SE is an indicator to measure learners' confidence, GP to measure learners' confidence towards their learning group, ACL represents students' state in the collaborative learning environment, and teacher support, the mediator, measures learners' perception of assistance from their teachers.

This study is interdisciplinary; the intervention methods adopted in the OD field combine the achievements of psychology and organizational behavior, and are widely used in various institutions, especially in enterprises. The action research framework is to implement an action intervention according to the actual situation of the class organization in universities. The action research framework of this study is as follows (see Figure 3).
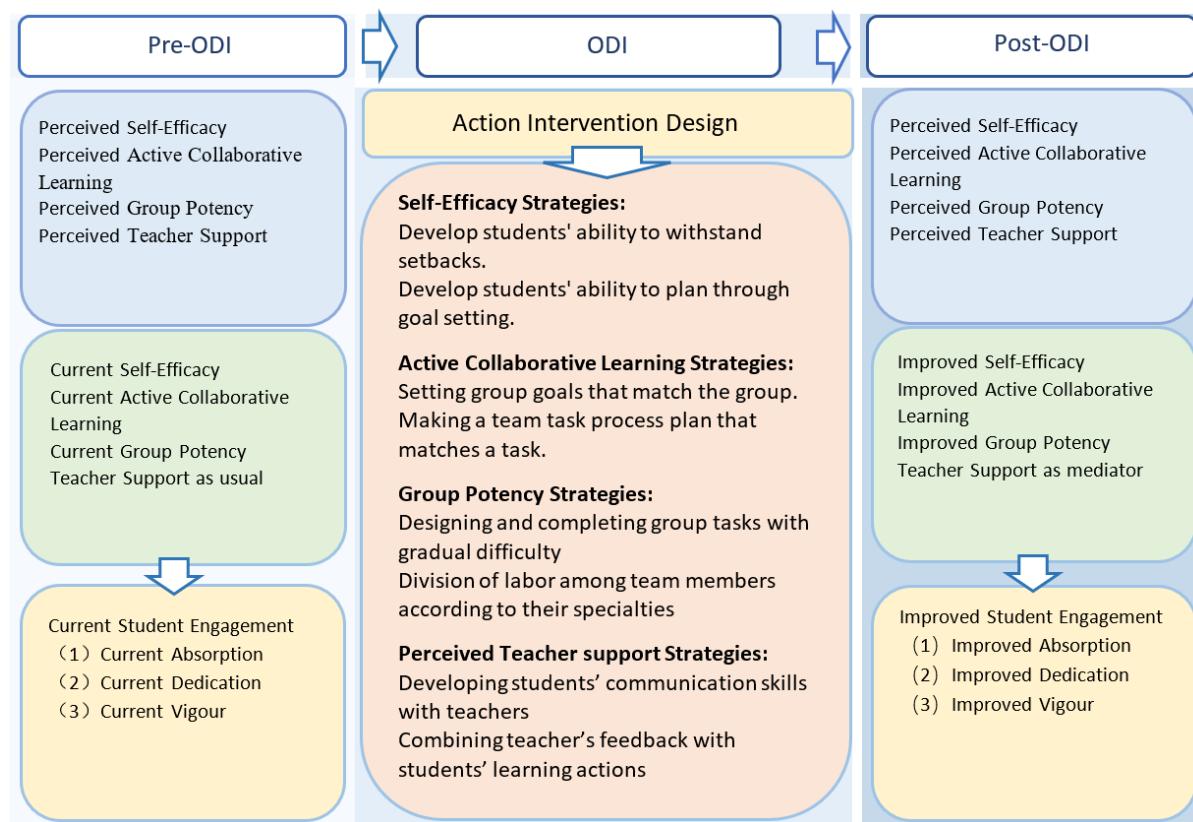
Figure 3 Action Research Framework

Hypotheses

H1: There is a statistically significant change in students' self-efficacy before and after ODI.

H2: There is a statistically significant change in students' active collaborative learning before and after ODI.

H3: There is a statistically significant change in students' group potency before and after ODI.

H4: There is a statistically significant change in teacher support before and after ODI.

H5: There is a statistically significant change in student engagement before and after ODI.

H6: After ODI, between Self-efficacy and Student Engagement, the mediating effect of Teacher Support is statistically significant.

H7: After ODI, between Active Collaborative Learning and Student Engagement, the mediating effect of Teacher Support is statistically significant.

H8: After ODI, between Group Potency and Student Engagement, the mediating effect of Teacher Support is statistically significant.

Methodology

This study is a quasi-experimental study with a pre- and post-test design implemented by mixed methods. It is used to examine whether the use of organizational development interventions (ODI) on SE, ACL, and GP, mediated by teacher support, can improve SE. A pre ODI–post ODI design was employed. Quasi-experimental designs were used in situations where it was impossible to conduct real experiments in application environments. The philosophical approach of the design is epistemology, which is based on Pragmatism. Mertler's Action Research Model was adopted.

The quantitative part utilized a five-point Likert scale questionnaire, comprising 31 items, which were administered to both the control and experimental groups before and after the interventions. The

qualitative data consisted of two parts: three reflective reports and one focus group interview. The qualitative data served to corroborate the quantitative data, while also delving into the underlying reasons behind the results of the quantitative data.

Pre-ODI Stage

Through conducting a survey among 11 in-service teachers within the organization and performing a SWOT and SOAR analysis, the researcher identified existing issues within the organization and the framework for the research methodology during the pre-ODI phase. It was determined that the use of OD interventions would influence learners' self-efficacy, active collaborative learning, and group potency to enhance student engagement in the course. Additionally, the study aimed to examine whether teacher support played a mediating role in this process.

ODI Stage

Building upon the findings from the pre-ODI stage, the researcher implemented Organizational Development (OD) interventions. The study involved two classes, designated as the control group and the experimental group, comprising 39 and 37 participants, respectively. The experimental group was subjected to a total of fifteen OD interventions during the intervention period, which were designed to exert a positive influence on the students' self-efficacy, active collaborative learning, and group potency.

Post-ODI Stage

The objective of the post-ODI phase is to conduct a comparative analysis of the data pre- and post-OD interventions, discerning the disparities therein and elucidating the underlying causes of these variances. Subsequently, the hypotheses posited by the current study are subjected to rigorous testing, yielding the resultant research outcomes. In the context of the action research paradigm, this phase also mandates a reflective assessment of all completed steps, furnishing essential insights for the initiation of subsequent action research endeavors, thus facilitating the transition into the next iterative cycle of action research.

Development of OD interventions

This study aims to enhance student engagement in their coursework through OD interventions, targeting the constructs of student self-efficacy, active collaborative learning, and group potency. Consequently, the design of the OD interventions primarily considered the following factors: (1) the findings from the pilot research, (2) the research questions established for this study, and (3) the independent variables of the study.

Table 1 ODI Implementation Decomposition Table

Teaching Week	Session No.	Teaching Content	ODI	Target
Week 1 (9th Week)	1	Types of Import Tariffs	Goal setting for individuals	Determining the individual's clear goals in learning this course, and having confidence in their own abilities
	2	The effects of Import Tariffs	Johari Window	Encouraging students to be more open with others and help students give feedback to others
Week 2 (10th Week)	3	Forms of Non-tariff Barriers	Goal setting for teams (1st)	Making clear the goal of the group in learning this course and improving confidence in the ability of the group
	4	Effects of Non-tariff Barriers	Team building (group norms and followership)	Determining or revising the team operation rules to make the rules more reasonable and effective
Week 3 (11th Week)	5	Export Subsidy and Production Subsidy	SOAR Analysis of the team	Finding out the advantages of the members of the group and making clear the advantages of the group
		Export Restrictions and Import Promotion Policies	Team building (Individual coaching and feedback)	Group members learning from each other what other members are good at and providing
Week 6 (14th Week)	10	Economic Integration	(Group leadership)	team, and exchange of workable skills in group management
	11	The Static and Dynamic Effects of Regional Economic Integration	Team building (Collaboration of team members)	Enhancing the synergy of team members and skills of group member effective communication
Week 7 (15th Week)	12	Economic Integration in Europe, North America and Asia	Team building (Reflection for improvement)	Reflecting on the tasks that the team has completed at present and putting forward suggestions for improvement
	13	GATT	Team building (Group effectiveness)	How to improve the efficiency of this group's task completion.
Week 8 (16th Week)	14	WTO	Team building (peer support)	Looking back on the group activities, what help did you get in completing the group tasks?
	15	China and the WTO	Team building (Team performance feedback)	Summarizing the group activities and providing feedback to the group output.

OD interventions have been implemented in two forms: (1) classroom teaching; (2) extracurricular student guidance. The interventions were completed by the instructor of International Trade Theory (ITT) to reflect the final student engagement.

Data Collection and Analysis Tools

The research questions and the instruments are listed in Table 2. Totally 32 closed-ended questions were designed in the questionnaire, and all items used a Likert five-point scale. The validity was tested with item objective congruence (IOC). After the amendment, all five experts approved the items, and the mean of Alpha Indices is 0.8138, higher than 0.7, indicating a sound validity of the questionnaire. The quantitative data of the questionnaire were analyzed with SPSS 27, focusing on (1) significance comparison and (2)

mediation effect analysis. The significance comparison included the analysis of the difference within and across groups of all five variables before and after OD Interventions. This part used text analysis via SPSS 27. The analysis of the mediation effect was completed via the plugin PROCESS of SPSS 27.

Table 2 Research Procedural Table

Research Questions	Research Instrument	Respondents	Research Analysis	Output
1. What kind of relationship between collaborative learning, self-efficacy, group potency and teacher support, and improve student engagement under the SWFU setting?	Quantitative – survey questionnaire	All students of the two classes (76)	Descriptive Analysis	Situations of IVs and DV before and after ODI
2. What instruments can be used to test collaborative learning, self-efficacy, group potency, teacher support and student engagement?	Quantitative – survey questionnaire	All students of the two classes (76)	Descriptive Analysis	Questionnaire with appropriate reliability and validity
3. What is the current situation of students' collaborative learning, self-efficacy, group potency, teacher support and student engagement?	Quantitative – survey questionnaire	All students of the two classes (76)	Descriptive Analysis	Situations of IVs and DV before and after ODI
4. What kind of intervention measures can be adopted to improve students' collaborative learning, self-efficacy, group potency and teacher support through regular interventions, so as to improve students' engagement?	Quantitative – survey questionnaire	All students of the two classes (76)	Descriptive Analysis	Four-stage interventions that workable to the current HE situation
5. What kind of possible model that helps to improve the student engagement of university students in China?	Quantitative – survey questionnaire	All students of the two classes (76)	Descriptive Analysis	A workable model for improving student engagement (DV) in the current HE situation
6. Can the qualitative research results of this study support the quantitative research results?	Qualitative – reflective report, focus group	(1) Reflective report: All students of the two classes (76): (2) Focus group: 12 students	Content Analysis	The result consistency of reflective reports and focus group; the result consistency of quantitative data and qualitative data;

The collection of qualitative data was completed with focus group interviews and a reflective report. The focus group interview was conducted after the post-ODI questionnaire to confirm and expand the information obtained from the questionnaires. The reflective reports have been submitted three times for all students: the first half of the semester, after several rounds of group tasks, the second half of the intervention, and the time after the collection of questionnaires at the end of the intervention. The qualitative data were analyzed with MaxQDA.

Results

This section delves into the demographic characteristics of the study participants, followed by the results of quantitative and qualitative data, respectively.

Demographic Profile of Participants

The students who participated in this study were all from the Business English major of the Southwest Forestry University, China, grade of the 2021 grade. The control group consisted of 39 individuals, and the experimental group 37. In the control group, there were 4 males, accounting for 11.43% of the group, while the experimental group had 5 males, 13.51%. The average age of the members in both groups was similar, with the control group averaging 20.82 years and the experimental group 20.89. Regarding the geographical origin of the students, the two groups' data were close. The proportion of students from Yunnan Province in the control group was 84.64%, and the experimental group was 83.80%.

Quantitative Data Analysis

The pre-ODI and post-ODI questionnaire data comparison of the two groups is summarized in Table 3.

Table 3 Differences between Pre-- and Post-OD Interventions in the Same Group

	The Experimental Group Pre and Post OD Interventions		The Control Group Pre and Post OD Interventions	
	Value	Result	Value	Result
SE (IV-1)	$P < .001 < 0.05$	Significant	$P = .146 > 0.05$	Not significant
ACL (IV-2)	$P < .001 < 0.05$	Significant	$\underline{P < .955 > 0.05}$	Not significant
GP (IV-3)	$P < .001 < 0.05$	Significant	$P = .798 > 0.05$	Not significant
TS (M)	$\underline{P < .001 < 0.05}$	Significant	$\underline{P = .914 > 0.05}$	Not significant
StuE (DV)	$P < .001 < 0.05$	Significant	$P < .073 > 0.05$	Not significant

Note. SE = Self-Efficacy; ACL = Active Collaborative Learning; GP = Group Potency; TS = Teacher Support; StuE = Student Engagement; Values calculated by Wilcoxon Signed-Rank Test were underlined.

The table shows that after ODI, the data of the experimental group changed statistically, while the data of the control group did not. Therefore, based on the statistical data, the OD interventions have played a positive role in students' course learning process (the experimental group) and compared with students (the control group) who have not received OD interventions.

The mediation analysis of this study was completed by using the PROCESS plug-in based on IBM SPSS 27. The model 4 in PROCESS Version 4.3 is used in this study. Totally, there are three independent variables in the design of this study: Self-Efficacy (SE), Active Collaborative Learning (ACL), and Group Potency (GP). The possible mediator is Teacher Support (TS), and the dependent variable is Student Engagement (StuE).

Using PROCESS 4.3 to calculate the Self-Efficacy (SE) as X, Teacher Support (TS) as M, and Student Engagement (StuE) as Y, the results are in Table 4.

Table 4 Effects of Student Efficacy (SE) on Student Engagement (StuE)

	Effect	SE	t	p	Boot CI (LL)	Boot CI (CL)	Proportion
Total Effect	-0.0406	0.1548	-0.2623	0.7946	-0.3549	0.2737	
Direct Effect	-0.0319	0.1574	-0.2025	0.8408	-0.3518	0.288	78.57%
Mediation Effect	-0.0087	0.0347			-0.0832	0.0658	21.43%

The direct effect dominated the proportion (78.57%), so it is considered that the influence of the mediation effect is not statistically significant.

The second independent variable is Active Collaborative Learning (ACL). Considering ACL as X, TS as M, and StuE as Y, the results are in Table 5.

Table 5 Effects of Active Collaborative Learning (ACL) on Student Engagement (StuE)

	Effect	SE	t	p	Boot CI (LL)	Boot CI (CL)	Proportion
Total Effect	0.1439	0.1827	0.7878	0.4361	-0.2270	0.5149	
Direct Effect	0.1756	0.1889	0.9298	0.3590	-0.2082	0.5595	/
Mediation Effect	-0.3017	0.0770			-0.2435	0.0879	/

The indirect effect of ACL arriving at StuE through TS is -0.0317, and its bootstrap is a 95% confidence interval (-0.02435, 0.0879), and the interval contains 0. The direct effect is not clear. It is considered that the influence of the mediation effect is not statistically significant.

The third independent variable is Group Potency (GP). In the following mediation effect test, Group Potency (GP) is considered as X, TS as M, and StuE as Y. The results are listed in Table 6.

Table 6 Effects of Group Potency (GP) on Student Engagement (StuE)

	Effect	SE	t	p	Boot CI (LL)	Boot CI (CL)	Proportion
Total Effect	0.1348	0.1370	0.9837	0.3320	-0.1434	0.4130	
Direct Effect	0.1357	0.1384	0.9803	0.3339	-0.1456	0.4170	100.67%
Mediation Effect	-0.0009	0.0229			-0.0700	0.0279	-0.67%

The indirect effect of GP arriving at Student StuE through TS is -0.0009, and its bootstrap is a 95% confidence interval (-0.0700, 0.0279), and the interval contains 0, so it is considered that the influence of the mediation effect is not significant.

The three independent variables in this research framework act on the dependent variables through the assumed mediator, TS. However, the calculation through the PROCESS plug-in of SPSS shows that this effect has not reached a statistically significant level.

Quantitative Data Analysis

Each participant wrote three reflective reports. The three reflective reports from both the experimental group and the control group were written at the same time to ensure that the participants were in the same learning environment.

The reflective reports are semi-open, providing a framework, but are not limited to the content. The three framework questions are listed in Table 7.

Table 7 Guiding Questions in the Reflective Report

No.	Guiding Questions
1	In order to make our team perform better in the process of completing group tasks, what improvements
2	In order to make our team perform better in the process of completing the task, what improvements
3	Anything else you want to say to your instructor:

The first guiding question covers Self-Efficacy. It also relates to the connection between an individual and the group. The second covers key issues of ACL and GP. The third related to the teacher, the researcher. Students can express whatever they want to teachers. In the code deductive stage, the only scope was relating to problems and difficulties of students.

Three coders with doctoral degrees were good at qualitative research methods. They kept close communication with the researcher during the coding process. When completing the first batch of reflective reports, three coders negotiated with the researcher to add 7 codes based the actual situation of the reports

as the inductive codes. They are peer modeling, self-improvement, teamwork skills, plans and goals, leadership, and management, TCS (Teaching Content Suggestions), and TCS (Teaching Content Suggestions).

The following co-occurrence relationship reflects strong and weak correlation between codes. The co-occurrence between codes in the reflective reports of the control group is shown in Figure 4.
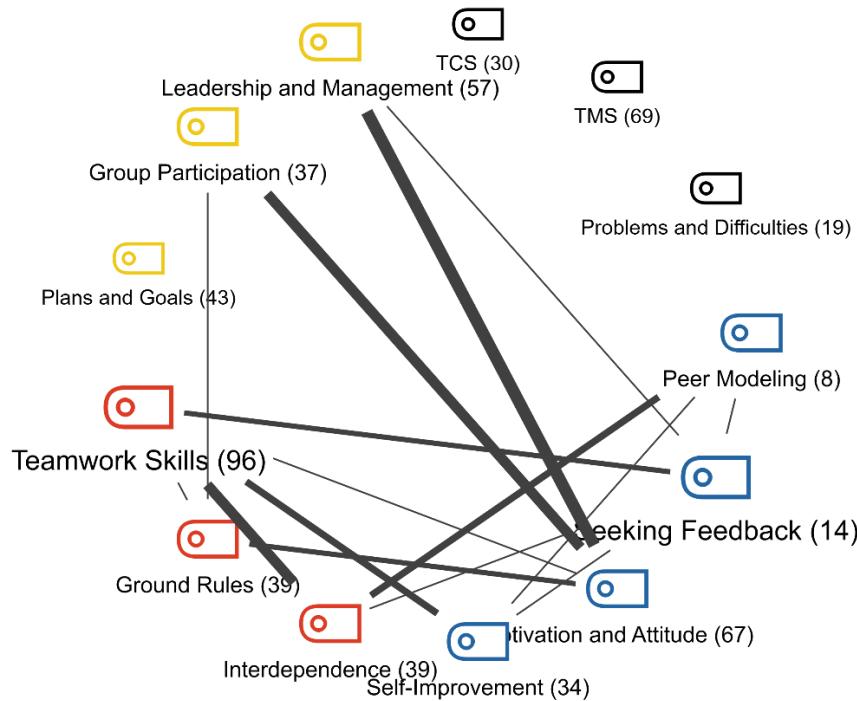
Figure 4 Code Co-occurrence Model of the Control Group

This model shows the strongest association between "Leadership and Management" and "Motivation and Attitude", followed by "Group Participation" and "Motivation and Attitude". The code "Motivation and Attitude" shows the role of a hub in this diagram. Figure 5 shows the situation of the experimental group.

Citation   Liu, X., & Lu, L. (2025). Interventions on Student Engagement: An Action Research Study of Business English Class in Southwest Forestry University in China. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 101-120; DOI: **https://doi.org/10.60027/ijsasr.2025.5827**
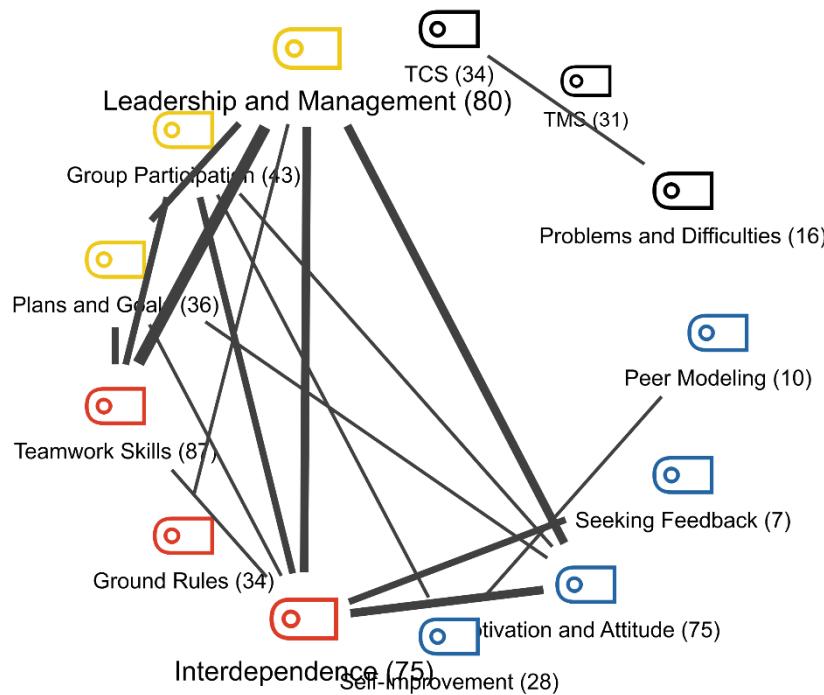
Figure 5 Code Co-occurrence Model of the Experimental Group

Contrary to the control group, the Code Co-occurrence in the experimental group demonstrates a strong correlation between TS (Teamwork Skills) and LM (Leadership and Management). Meanwhile, the Code Co-occurrence in the control group also reveals significant associations between LM and GP (Group Participation), PL (Plans and Goals), as well as Interdependence. The relationships among these five codes are closely related to more profound group collaboration and explicit group division of labor. Conversely, the Code Co-occurrence Figure of the control group does not reflect the aforementioned associations, which aligns with the quantitative data analysis results of this study, indicating no significant changes in the control group after intervention. The focus group members of each class were composed of six students, and they were chosen randomly. Chinese was used throughout the activity to ensure that students participating in focus groups could speak freely and precisely.

The researcher used six questions related to the questionnaire to explore the students' experiences and real feelings to obtain more detailed information, as follows (Table 8).

Table 8 Report Focus Group Semi-Structured Questions

No.	Questions
1	How do you think your self-confidence in learning has changed through this semester's study?
2	What difference does this learning method bring to you through the joint study of group members?
3	Are you confident in your team's task? Why?
4	What kind of help and support do you think the teacher provided you during the course?
5	Compared with the previous courses, how will the study of this course be different for you in
6	If you want to further improve this course, what are your opinions and suggestions?

The revised English manuscript was encoded by the same coders. MaxQDA's Coded Segments diagram function was used to illustrate the control group in Figure 6. The maximum number of codes was

a problem and differences, reaching 42. Followed by Negative Attitude, reaching 30. The codes with relatively concentrated density also included Teamwork Skills and Self-Improvement, both of which had reached 19 times. There were 12 in Leadership and Management. The number of Group Participation was 10, and the codes with less than 10 were Interdependence (7) and Peer Modeling (2).
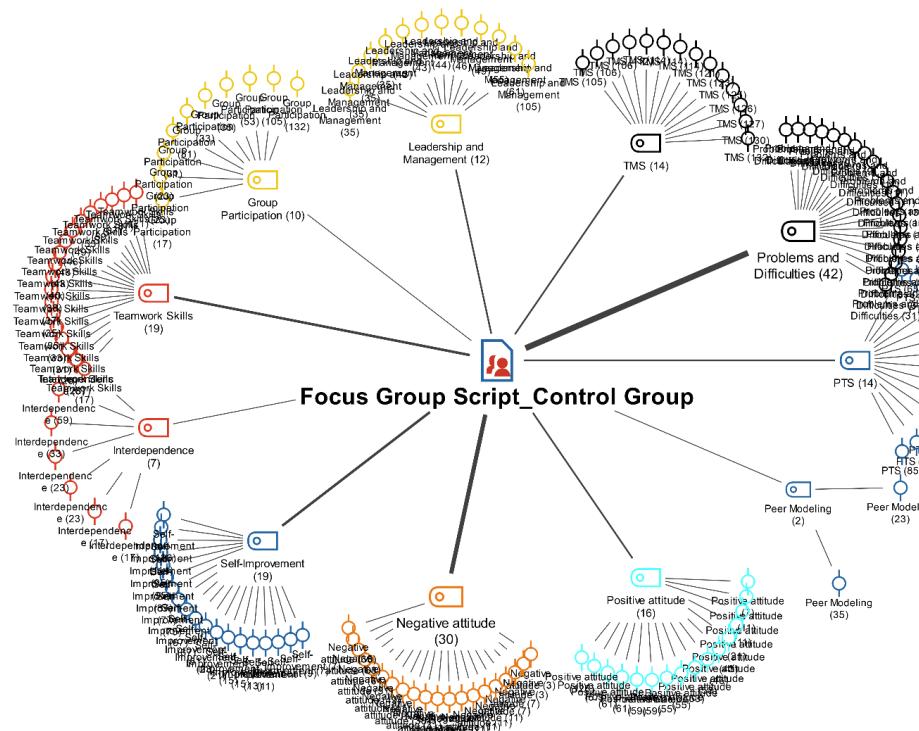
Figure 6 Focus Group Coded Segments of the Control Group

The two most prevalent codes in the control group, namely, "Problem and Difficulty" and "Negative Attitude", indicate that the group possessed relatively strong negative emotions.
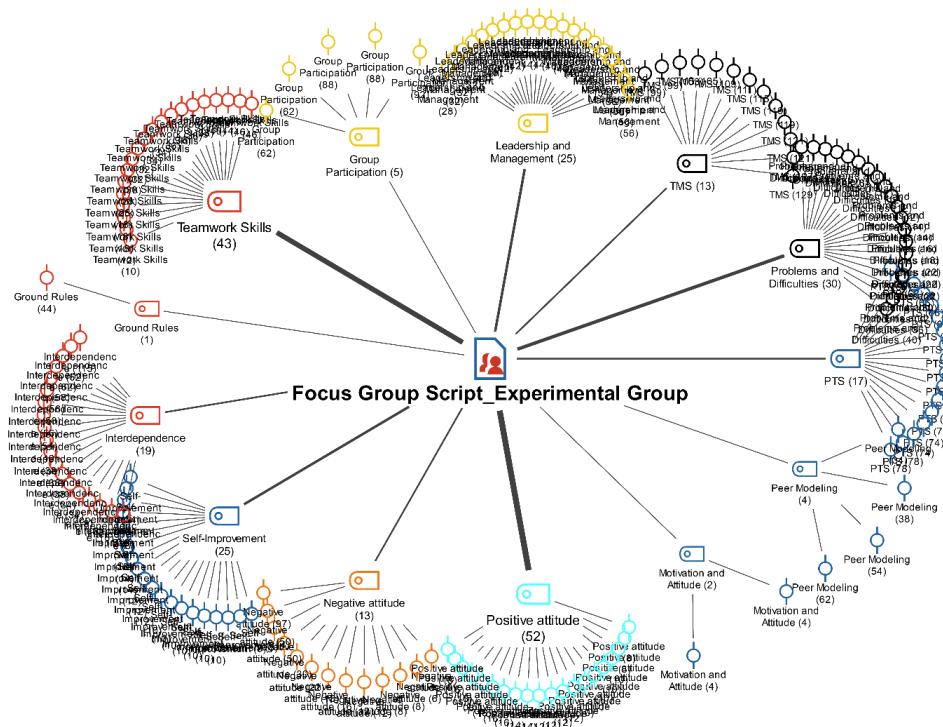
Figure 7 Focus Group Coded Segments of the Experimental Group

The experimental group, Figure 7, demonstrated a significant advantage in the number of codes related to "Positive Attitude" and "Teamwork Skills". Specifically, the number of codes for "Positive Attitude" reached 52, while "Teamwork Skills" closely followed with 43 codes, surpassing the number of codes for "Problems and Differences" in the control group. Additionally, the experimental group recorded 19 codes for "Interdependence", also exceeding the control group's count of 7. Both "Negative Attitude" and "TMS (Teaching Method Suggestions)" had 13 codes each in the experimental group. The Coded Segments of the experimental group revealed a more positive attitude and heightened teamwork among members during the completion of various learning tasks, in stark contrast to the control group's negative sentiments and a higher prevalence of difficulties and issues.

Discussion
The hypotheses of this study are stated as follows.
Research Hypothesis 1
Ho1: There is no statistically significant change in students' self-efficacy before and after ODI.
Ha1: There is a statistically significant change in students' self-efficacy before and after ODI.
The paired t-test result that SE in the experiment group reaches a significant progress, which can be shown from the Sig value (p) of the Paired-Samples T Test: being < .001; the self-efficacy in the control group does not have a significant change, which can be revealed from its Sig value (p) of the Paired-Samples T Test being 1.484 > 0.05. Ho1 was rejected.

Research Hypothesis 2
Ho2: There is no statistically significant change in students' active collaborative learning before and after ODI.
Ha2: There is statistically significant change in students' active collaborative learning before and after ODI.
From Table 4, the paired t-test result of ACL in the experimental group was $P < .001 < 0.05$, indicating that there is statistically significant difference between pre and post interventions. In the control group, the Wilcoxon Signed-Rank Test value $P < 0.955$ which is greater than 0.05, suggesting that there is no statistical difference. Ho2 was rejected.

Research Hypothesis 3
Ho3: There is no statistically significant change in students' group potency before and after ODI.
Ha3: There is statistically significant change in students' group potency before and after ODI.
    Table 4 shows that the paired t-test result of GP in the experimental group was P <. 001 < 0.05, which means there is statistically significant difference between pre and post interventions. In the control group, P = 0.798 > 0.05, implying that the difference is not significant. Ho3 was rejected.

Research Hypothesis 4
Ho4: There is no statistically significant change in teacher support before and after ODI.
Ha4: There is statistically significant change in teacher support before and after ODI.
    Based on the data of Table 4, the Wilcoxon Signed-Rank Test result of TS in the experimental group was P < 0.001 < 0.05, which means there is statistically significant difference between pre and post interventions. In the control group, its Wilcoxon Signed-Rank Test P = 0.914 which is greater than 0.05, implying that the difference is not significant. Ho4 was rejected.

Research Hypothesis 5
Ho5: There is no statistically significant change in student engagement before and after ODI.
Ha5: There is a statistically significant change in student engagement before and after ODI.
    Table 4 provides the data of the paired t-test result of SE in the experimental group was P < 0.001 < 0.05, denoting that there is a statistically significant difference between pre- and post interventions. In the control group, P < 0.073 which is greater than 0.05, implying that the difference is not significant. Ho5 was rejected.

Research Hypothesis 6
Ho6: After ODI, between Self-efficacy and Student Engagement, the mediating effect of Teacher Support is not statistically significant.
Ha6: After ODI, between Self-efficacy and Student Engagement, the mediating effect of Teacher Support is statistically significant.
    Table 5 provides the data of mediating effects of Student Efficacy (SE) on StuE and Figure 4.4 illustrates the relationship between the three variables. The indirect effect of SE arriving at StuE through TS was 0.0087, and its bootstrap was 95% confidence interval (-0.0832, 0.0658). This interval contains 0, so Ho6 was accepted.

Research Hypothesis 7
Ho7: After ODI, between Active Collaborative Learning and Student Engagement, the mediating effect of Teacher Support is not statistically significant.
Ha7: After ODI, between Active Collaborative Learning and Student Engagement, the mediating effect of Teacher Support is statistically significant.
    Table 6 provides the data of mediating effects of ACL on StuE and Figure 4.5 illustrates the relationship between the three variables. According to Table 4.42, the indirect effect of ACL arriving at StuE through TS was -0.0317, and its bootstrap was 95% confidence interval (-0.02435, 0.0879). This interval contains 0. Ho7 was accepted.

Research Hypothesis 8
Ho8: After ODI, between Group Potency and Student Engagement, the mediating effect of Teacher Support is not statistically significant.
Ha8: After ODI, between Group Potency and Student Engagement, the mediating effect of Teacher Support is statistically significant.
    Table 7 provides the data of mediating effects of GP on StuE and Figure 4.6 illustrates the variable relationship. According to Table 5, the indirect effect of GP arriving at StuE through TS was -0.0009, and its bootstrap was 95% confidence interval (-0.0700, 0.0279). This interval contains 0. Ho8 was accepted.

Conclusion
    Research Question 1

Determine the relationship between four variables - collaborative learning, self-efficacy, group potency, teacher support - and student engagement within the context of Southwest Forestry University.

Self-efficiency, active collaborative learning, and group potency were closely related to and had an impact on student engagement. The experimental group showed significant changes after interventions (Table 3). Teacher support had a significant impact on student engagement, but according to Table 4, Table 5 and Table 6, the mediating effect of it to self-efficiency, active collaborative learning, and group potency was not significant.

Research Question 2

Determine appropriate measurement tools for assessing collaborative learning, self-efficacy, group potency, teacher support, and student engagement among students enrolled at Southwest Forestry University.

The questionnaire contains 31 items, of which (1)-(6) are about SE, using the questionnaire of Chen et al. (2001); (7)-(10) ACL, using the questionnaire of Qureshi et al. (2021); (11)-(17) relate to GP, using the questionnaire of Guzzo et al. (1993); (18)-(22) is TS, using the questionnaire of Dubow and Ullman (1989); (23)-(31) for SE, the questionnaire of Snijders et al. (2021) was used. Regarding the validity of the questionnaire, the combined questionnaire was adapted and passed the IOC of all the six experts. Regarding the reliability of the overall questionnaire, through the pilot test of the questionnaire, the average value of Cronbach's coefficient alpha (α) indicators was 0.8138.

Research Question 3

What is the current situation of students' collaborative learning, self-efficacy, group potency, teacher support and student engagement?

Students' current situation of the variables can be presented by this study quantitatively and qualitatively.

Before the ODI, questionnaire data showed there was no significant difference between the two groups except for Student Efficacy (SE). However, after the ODI, except for Teacher Support (TS), there were statistically significant differences between the two groups, and the experimental group was better than the control group.

Qualitative research data also confirmed the results of the above quantitative research in multiple dimensions. The Code Co-occurrence Model diagrams (Figure 4, Figure 5) showed that the strongest correlation of the experimental group was "Leadership and Management" and "Teamwork Skills", among which "Leadership and Management" was the hub of the co-occurrence model diagram of the experimental group.

Research Question 4

What kind of intervention measures can be adopted to improve students' collaborative learning, self-efficacy, group potency and teacher support through regular interventions, so as to improve student engagement?

The OD interventions in this study formed a combination, which was divided into four stages. (1) The first intervention stage based on Johari Window and Goal setting; (2) The second intervention stage with SOAR and Individual coaching as the mainstay; (3) the third intervention stage, which was mainly based on Group Leadership and Collaboration of team members; And (4) the fourth intervention stage, which focused on Reflection for improvement and Group effectiveness. The questionnaire data before and after OD intervention showed a statistically significant difference (Table 4), and the qualitative research data also showed that the experimental group after intervention had a more explicit willingness to participate in group activities (Figure 6) and group management and group activities (Figure 7). The combination used in this study had a significant impact on Student Engagement.

Research Question 5

What kind of possible model that helps to improve student engagement in China?

Based on the conceptual framework (Figure2), this study put forward the teaching mode of improving Student Engagement of university course by intervening three independent variables (SE, ACL, and GP) with TS as the intermediary variable. The mediating relationship or the mediating effect was not significant. After ODI, the TS in the experimental group was significantly improved, and the focus group result also showed that students agreed with the improvement of Teacher Support. The conceptual framework is now adjusted accordingly as follows (Figure 8).
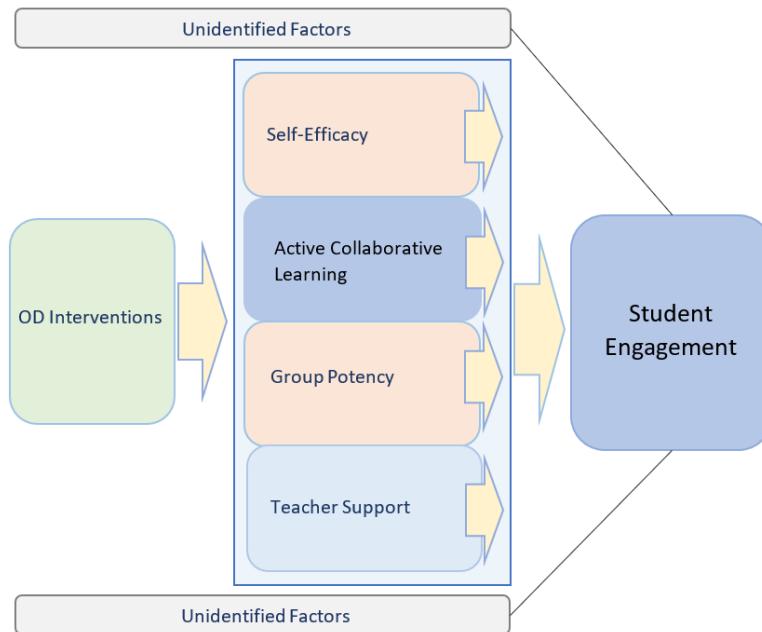
Figure 8 The Collaborative Learning Model

The adjusted mode regards Teacher Support as the same factor as self-efficiency, active collaborative learning and group potency, which has an impact on Student Engagement.

Research Question 6

Can the qualitative research results of this study support the quantitative research results?

The reflective reports compiled by all participants on three occasions, coupled with the outcomes of a focus group interview involving representative members, collectively demonstrate from diverse perspectives that compared to the control group, the experimental group exhibited a richer positive atmosphere (Figure 7) and leadership (Figure 5), with greater emphasis on teamwork (Figures 5 & 7) and individual roles within team activities (Figure 5). This not only aligns with the consistent trends observed in the questionnaire data of this study but also, from individual cases, highlights the disparities between the control group (which did not receive OD interventions) and the experimental group in aspects such as leadership, intra-group conflict resolution, and team collaboration. Findings of this study support the notion that StuE serves as a metric (Troussas et al., 2023) for monitoring and enhancing students' learning experiences and outcomes (Qureshi et al., 2023), albeit contrasting with prior research (Bilz et al., 2022) in that the mediating role of TS was not significant.

This study provides valuable insights into the intricate interplay of multifaceted factors that influence student engagement, with an emphasis on the mediating role of teacher support at Southwest Forestry University, Yunnan, China. Both the qualitative and quantitative findings of this study support the significant role of OD intervention in enhancing student engagement. However, the mediating effect of teacher support did not manifest prominently, indicating no statistically significant difference. Several limitations have been acknowledged in the present study, primarily pertaining to the constrained sample size, the professional constraints of the participants, and the limited number of action research cycles conducted. Consequently, the generalizability of the findings is inherently limited. To address these limitations and enhance the robustness of the conclusions, future research endeavors are imperative, necessitating the expansion of the sample size, broadening the scope of majors represented, and incorporating additional cycles of action research.

Recommendation

To effectively apply the research findings in higher education, future endeavors should emphasize several key strategies. Firstly, expanding the sample size and scope will enhance the generalizability of the results. Secondly, developing tailored assessment tools for Teacher Support (TS) is crucial for accurately

measuring its mediation effects, thereby enriching the research landscape. Thirdly, examining the impact of coursework variations on student engagement will provide insights into optimizing educational programs. Fourthly, exploring TS across diverse student cohorts, including individuals with varying personalities and motivations, will further our understanding of its influence. Lastly, studying OD intervention strategies with a focus on leadership and utilizing generative AI for data management will address the challenges faced by classroom instructors in balancing daily teaching responsibilities with monitoring student progress.

The OD intervention has demonstrated a positive influence on enhancing student engagement, yet there are still myriad avenues for further exploration within related domains. Specifically, investigating whether variations in coursework elicit differential impacts on students' learning enthusiasm and engagement levels is a noteworthy area of research. Additionally, delving deeper into the mediation effects of TS will necessitate the refinement of assessment tools. Moreover, examining the strategies and modalities employed in OD interventions, particularly with a focus on leadership research, holds significant merit. Lastly, harnessing generative AI to categorize and organize student data offers a potential solution to the considerable challenge of balancing teaching responsibilities with monitoring student progress, enabling teachers to streamline their workload and address these issues more effectively.

References

Affuso, G., Zannone, A., Esposito, C., Pannone, M., Miranda, M. C., De Angelis, G., & Bacchini, D. (2023). The effects of teacher support, parental monitoring, motivation and self-efficacy on academic performance over time. European Journal of Psychology of Education, 38(1), 1-23.

Aladsani, H. K. (2022). A narrative approach to university instructors' stories about promoting student engagement during COVID-19 Emergency Remote Teaching in Saudi Arabia. Journal of Research on Technology in Education, 54(1), S165-S181.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* Worth Publishers

Barkley, E. F., & Major, C. H. (2020). *Student engagement techniques: A handbook for college faculty.* John Wiley & Sons.

Bear, G. G., Yang, C., Chen, D., He, X., Xie, J.-S., & Huang, X. (2018). Differences in school climate and student engagement in China and the United States. *School Psychology Quarterly*, 33(2), 323.

Bilz, L., Fischer, S. M., Hoppe-Herfurth, A.-C., & John, N. (2022). *A Consequential Partnership.* Zeitschrift für Psychologie.

Blasco-Arcas, L., Buil, I., Hernández-Ortega, B., & Sese, F. J. (2013). Using clickers in class. The role of interactivity, active collaborative learning and engagement in learning performance. *Computers & Education*, 62, 102-110.

Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a new general self-efficacy scale. *Organizational Research Methods, 4*(1), 62–83. https://doi.org/10.1177/109442810141004

De Jong, A., De Ruyter, K., & Wetzels, M. (2005). Antecedents and consequences of group potency: A study of self-managing service teams. *Management Science, 51*(11), 1610-1625.

Diseth, Å. (2011). Self-efficacy, goal orientations and learning strategies as mediators between preceding and subsequent academic achievement. *Learning and individual differences, 21*(2), 191-195.

Dubow, E. F., & Ullman, D. G. (1989). Assessing social support in elementary school children: The Survey of Children's Social Support. *Journal of Clinical Child Psychology, 18*(1), 52–64. https://doi.org/10.1207/s15374424jccp1801_7

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of educational research, 74*(1), 59-109.

Friend, M., & Cook, L. (2014). *Interactions: Collaboration skills for school professionals (7th ed.).* Harlow: Pearson Education Limited.

Gevers, J. M., Li, J., Rutte, C. G., & van Eerde, W. (2020). How dynamics in perceptual shared cognition and team potency predict team performance. *Journal of Occupational and Organizational Psychology, 93*(1), 134-157.

Gully, S. M., Incalcaterra, K. A., Joshi, A., & Beaubien, J. M. (2002). A meta-analysis of team-efficacy, potency, and performance: interdependence and level of analysis as moderators of observed relationships. *Journal of applied psychology, 87*(5), 819.

Guzzo, R. A., Yost, P. R., Campbell, R. J., & Shea, G. P. (1993). Potency in groups: Articulating a construct. *British Journal of Social Psychology*, 32(1), 87-106

Hutain, J., & Michinov, N. (2022). Improving student engagement during in-person classes by using functionalities of a digital learning environment. *Computers & Education*, 183, 104496.

Jalaluddin, I., Yamat, H., & Yunus, M. M. (2013). ESL writing self-efficacy: Contribution to ESL writing skills development. *IOSR Journal of Research & Method in Education,* 2(1), 37-47.

Kahu, E. R. (2013). Framing student engagement in higher education. *Studies in Higher Education,* 38(5), 758-773.

Kahu, E. R., & Nelson, K. (2018). Student engagement in the educational interface: understanding the mechanisms of student success. *Higher Education Research & Development*, 37(1), 58-71.

Klem, A. M., & Connell, J. P. (2004). Relationships matter: Linking teacher support to student engagement and achievement. *Journal of School Health*, 74, 262-273.

Kristianto, H., & Gandajaya, L. (2023). Offline vs online problem-based learning: a case study of student engagement and learning outcomes. Interactive Technology and Smart Education, 20(1), 106-121.

Kuh, G. D. (2009). The national survey of student engagement: Conceptual and empirical foundations. *New directions for institutional research,* 141, 5-20.

Liu, L., & Guo, L. (2023). Digital financial inclusion, income inequality, and vulnerability to relative poverty. *Social Indicators Research, 170*(3), 1155–1181. https://doi.org/10.1007/s11205-023-03245-z

Mercer, S. H., Nellis, L. M., Martínez, R. S., & Kirk, M. (2011). Supporting the students most in need: Academic self-efficacy and perceived teacher support in relation to within-year academic growth. *Journal of School Psychology,* 49(3), 323-338.

Monteiro, R. B., & Vieira, V. A. (2016). Team potency and its impact on performance via self-efficacy and adaptability. *BAR-Brazilian Administration Review,* 13, 98-119.

Musselin, C. (2018). New forms of competition in higher education. *Socio-Economic Review,* 16(3), 657-683.

Qureshi, M. A., Khaskheli, A., Qureshi, J. A., Raza, S. A., & Yousufi, S. Q. (2021). Factors affecting students' learning performance through collaborative learning and engagement. *Interactive Learning Environments*, 2021, 1-21.

Qureshi, M. A., Khaskheli, A., Qureshi, J. A., Raza, S. A., & Yousufi, S. Q. (2023). Factors affecting students' learning performance through collaborative learning and engagement. *Interactive Learning Environments*, 31(4), 2371-2391.

Schaufeli, W. B., Martinez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B. (2002). Burnout and engagement in university students: A cross-national study. *Journal of cross-cultural psychology*, 33(5), 464-481.

Snijders, I., Wijnia, L., Kuiper, R., Rikers, R., & Loyens, S. (2021). Relationship quality in higher education and the interplay with student engagement and loyalty. *British Journal of Educational Psychology.* 92 (1). Doi: 10.1111/bjep.12455.

Sökmen, Y. (2021). The role of self-efficacy in the relationship between the learning environment and student engagement. *Educational Studies,* 47(1), 19-37.

Troussas, C., Giannakas, F., Sgouropoulou, C., & Voyiatzis, I. (2023). Collaborative activities recommendation based on students' collaborative learning styles using ANN and WSM. *Interactive Learning Environments,* 31(1), 54-67.

Wang, J., Tigelaar, D. E., Luo, J., & Admiraal, W. (2022). Teacher beliefs, classroom process quality, *and student engagement in the smart classroom learning environment: A multilevel analysis. Computers & Education,* 183, 104501.

Weinberger, Y., & Shonfeld, M. (2020). Students' willingness to practice collaborative learning. *Teaching Education,* 31(2), 127-143. https://doi.org/10.1080/10476210.2018.1508280

Yılmaz, F. G. K., & Yılmaz, R. (2022). Exploring the role of sociability, sense of community and course satisfaction on students' engagement in flipped classrooms supported by Facebook groups. *Journal of Computers in Education,* 1, 135-162. https://doi.org/10.1007/s40692-022-00226-y ·

Yin, H. (2023). A mixed blessing: Student engagement in emergency online learning during COVID-19 in China. *Assessment & Evaluation in Higher Education,* 48(3), 362–376. https://doi.org/10.1080/02602938.2022.2072469

Zheng, W., & Ou Yang, G. (2022). High-quality Development of Higher Education: Connotation, Challenge and Path. *Modern Education Management*, 387(6), 46-53. https://doi.org/10.16697/j.1674-5485.2022.06.006